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Proceedings of the American Academy of Arts and Sciences.

VOL. 58. NO. 17.—SEPTEMBER, 1923.

RECORDS OF MEETINGS, 1922–23.

BIOGRAPHICAL NOTICES.

OFFICERS AND COMMITTEES FOR 1923–24.

LIST OF THE FELLOWS AND FOREIGN HONORARY MEMBERS.

STATUTES AND STANDING VOTES.

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1. AMES, A., JR., PROCTOR, C. A., and AMES, BLANCHE.— Vision and the Technique of Art. pp. 1–47. 28 pls. February, 1923. $1.50.
2. BIRKHOFF, GEORGE D. and LANGER, RUDOLPH E. — The Boundary Problems and Developments Associated with a System of Ordinary Linear Differential Equations of the First Order. pp. 49–128. April, 1923. $3.15.
3. VAINIO, EDWARD A.— Lichenes in Insula Trinidad a Professore R. Thaxter Collecti. pp. 129–147. January, 1923. $1.00.
4. BRIDGMAN, P. W.— The Effect of Pressure on the Electrical Resistance of Cobalt, Aluminum, Nickel, Uranium, and Caesium. pp. 149–161. January, 1923. $.75.
5. BRIDGMAN, P. W.— The Compressibility of Thirty Metals as a Function of Pressure and Temperature. pp. 163–242. January, 1923. $1.70.
6. BAXTER, GREGORY P., WEATHERILL, PHILIP F. and SCRIPTURE, EDWARD W., JR.— A Revision of the Atomic Weight of Silicon. The Analysis of Silicon Tetrachloride and Tetrabromide. pp. 243–268. February, 1923. $.75.
7. EVANS, ALEXANDER W.— The Chilean Species of Metzgeria. pp. 269–324. March, 1923. $1.25.
8. BRUES, CHARLES T.— Some New Fossil Parasitic Hymenoptera from Baltic Amber, pp. 325–346. March, 1923. $.65.
9. KENNELLY, A. E.— Text of the Charter of the Academie Royale de Belgique, Translated from the Original in the Archives of the Academie at Brussels. pp. 347–351. April, 1923. $.40.
10. HITCHCOCK, FRANK L.— On Double Polyadics, with Application to the Linear Matrix Equation. pp. 353–395. May, 1923. $1.15.
11. HITCHCOCK, FRANK L.— Identities Satisfied by Algebraic Point Functions in N-Space. pp. 397–421. May, 1923. $.85.
12. SWAN, CLIFFORD M.— The Minimum Audible Intensity of Sound. pp. 423–441. May, 1923. $.75.
13. DUNN, EMMETT REID.— The Salamanders of the Family Hynobiidae. pp. 443–523. June, 1923. $1.75.
14. KELLOGG, O. D.— An Example in Potential Energy. pp. 525–533. June, 1923. $.45.
15. LEWIS, FREDERIC T.— The Typical Shape of Polyhedral Cells in Vegetable Parenchyma and the Restoration of that Shape following Cell Division. pp. 535–554. 3 pls. June, 1923. $.80.
16. WICK, FRANCES G.— The Effect of Pressure upon Optical Absorption. pp. 555–573. August, 1923. $.60.
17. RECORDS OF MEETINGS; Biographical Notices; Officers and Committees; List of Fellows and Foreign Honorary Members; Statutes and Standing Votes, etc. pp. 575–664. August, 1923. $.75.

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RECORDS OF MEETINGS.

One thousand one hundred and sixteenth Meeting.

OCTOBER 11, 1922.— STATED MEETING.

The Academy met at its House at 8.15 P.M.

The PRESIDENT in the Chair.

There were thirty-five Fellows present.

The Minutes of the Annual Meeting, of May 10, 1922, were read and approved.

Letters were presented by the Corresponding Secretary:— from W. S. Adams, Nathan Banks, T. M. Carpenter, Edward Channing, Stanley Cobb, Gano Dunn, J. L. Goodale, E. C. Kemble, George LaPiana, R. W. Lovett, William McDougall, A. K. Porter, A. C. Redfield, A. F. Rogers, P. J. Sachs, R. C. Tolman, W. H. Weston, Jr. and C. H. C. Wright, accepting Fellowship; from T. C. Allbutt, A. S. Eddington, Emmanuel de Margerie and Henri Pirenne, accepting Foreign Honorary Membership; from Thomas A. Edison declining election.

The President announced the deaths of the following Fellows:— Alexander Graham Bell, Class I., Section 2; Harold Clarence Ernst, Class II., Section 4; Henry Marion Howe, Class I., Section 4; Edward Hall Nichols, Class II., Section 4; Alexander Smith, Class I., Section 3; Williston Walker, Class III., Section 1.

The Corresponding Secretary presented the following biographical notices:— Julius von Hann, by R. deC. Ward; William Pfeffer, by D. H. Campbell; Seth Carlo Chandler, by E. S. King; Edward Hall Nichols, by E. H. Bradford.

On the recommendation of the Council, it was

Voted, To make a supplementary appropriation of $300 from the income of the General Fund, for the expenses of the Library.

The following communications were presented:—

Worthington C. Ford, "A Map of Virginia," with lantern slide illustrations.

Arthur Gordon Webster, "Real and Pseudo-Isophelematic Lines and their Use and Misuse in Geography."

The following papers were presented by title:—

"The Effect of Pressure on the Electrical Resistance of Cobalt, Aluminum, Nickel, Uranium, and Caesium," by P. W. Bridgman.

"The Compressibility of 30 Metals as a Function of Pressure and Temperature," by P. W. Bridgman.

"Note on Two Remarkable Ascomycetes," by Roland Thaxter.

Brief reports of delegates who represented the Academy at Padua, Brussels, and Paris, were then presented:—

C. H. Moore, The 700th Anniversary of the Founding of the University of Padua.

A. E. Kennelly, The 150th Anniversary of the Brussels Academy of Sciences and Letters.

J. R. Jewett, The 100th Anniversary of the Société Asiatique de Paris.

The meeting was dissolved at 10.30 P.M.

One thousand one hundred and seventeenth Meeting.

NOVEMBER 8, 1922.— STATED MEETING.

The Academy met at its House at 8.15 P.M.

The PRESIDENT in the Chair.

There were forty-two Fellows and two guests present.

The Minutes of the meeting of October 11 were read and approved.

The Corresponding Secretary announced that the Council had elected Harold Murdock, Treasurer, to fill the vacancy caused by the death of Henry H. Edes.

The President announced the deaths of the following Fellows:— John Casper Branner, Class II., Section 1; Henry Herbert Edes, Class III., Section 4; William Stewart Halsted, Class II., Section 4; Thomas Nelson Page, Class III., Section 4; and of the Foreign Honorary Member, Hermann Diels, Class III, Section 2.

A biographical notice of Harmon Northrop Morse, by Ira Remsen, was presented by the Corresponding Secretary.

The President reported that the Committee appointed to revise

Chapter III of the Statutes concerning procedure in the election of new members had made a report which would be submitted for approval by the Academy.

The Librarian made a statement regarding the Library and urged that Fellows make more frequent use of its valuable collections.

The following communications were presented:—

William McDougall, "Psychic Research: a Neglected Responsibility of Men of Science."

George F. Moore, "A Word about the Astronomical Theories of the Greeks."

The following paper was presented by title:—

"The Minimum Audible Intensity of Sound," by Clifford M. Swan, presented by P. W. Bridgman.

The meeting was dissolved at 10.15 P.M.

One thousand one hundred and eighteenth Meeting.

DECEMBER 13, 1922.— STATED MEETING.

The Academy met at its House at 8.20 P.M.

The PRESIDENT in the Chair.

There were twenty-five Fellows present.

The Minutes of the November 8th meeting were read and approved.

The Corresponding Secretary reported the gift, by Professor Charles Sprague Sargent, of copies of Volumes I and II of the Memoirs of the Academy, 1785 to 1804, in the original bindings, with the bookplate of Winthrop Sargent, elected a Fellow in 1788.

The President announced the death of Robert Wheeler Willson, Class I., Section 1.

The Council recommended to the Academy the following standing vote in regard to Resident Associates:—

Standing Vote, no. 4. The Council, under such rules respecting nominations as it may prescribe, may elect as Associates of the Academy a limited number of men of mark in affairs or of distinguished service in the community.

Associates shall be entitled to the same privileges as Fellows, but shall not have the right to vote.

The admission fee and annual dues of Associates shall be the same as those of Fellows residing within fifty miles of Boston.

It was

Voted, To lay this recommendation on the table until the next meeting, notice to be sent out.

The following communication was presented:—

S. Burt Wolbach, "Tumors: A Résumé of Facts and Theories," with lantern slide illustrations.

After the Communication, ballots were cast on the question of revising Chapter III of the Statutes, on the Election of Fellows and Foreign Honorary Members, as submitted in print.

The revision was adopted and Chapter III of the Statutes now reads as follows:

CHAPTER III

Election of Fellows and Foreign Honorary Members

Article 1. The procedure in the election of Fellows and Foreign Honorary Members shall be as follows:

Nominations to Fellowship or Foreign Honorary Membership in any Section must be signed by two Fellows of that Section or by three Fellows of any Sections, and sent to the Corresponding Secretary accompanied by a statement of the qualifications of the nominee and brief biographical data.

Notice shall be sent to every Fellow not later than the fifteenth of January in each year, reminding him that all nominations must be in the hands of the Corresponding Secretary before the fifteenth of February following.

A list of the nominees, giving a brief account of each, with the names of the nominators, shall be sent to every Fellow with a request that he return the list with such confidential comments and indications of preference as he may choose to make.

All the nominations, with any comments thereon and with expressions of preference on the part of the Fellows, shall be referred to the appropriate Class Committees, which shall canvass them, and report their recommendations in writing to the Council before the Stated Meeting of the Academy in April.

Elections of Fellows and Foreign Honorary Members shall be made

by the Council before the Annual Meeting in May, and announced at that meeting.

Persons nominated in any year, but not elected, may be carried over to the list of nominees for the next year at the discretion of the Council, but shall not be further continued unless renominated.

The meeting was dissolved at 10.15 P.M.

One thousand one hundred and nineteenth Meeting.

JANUARY 10, 1923.— STATED MEETING.

The Academy met at its House at 8.20 P.M.

The PRESIDENT in the Chair.

There were twenty-three Fellows and two guests present.

The Minutes of the December 13th meeting were read and approved.

On recommendation of the Council, it was

Voted, To appropriate the sum of $400 from the General Fund to be placed at the disposal of the House Committee.

The President announced the deaths of the following Foreign Honorary Members:— Friedrich Delitzsch, Class III., Section 2; Albert Venn Dicey, Class III., Section 1; Henry Jackson, Class III., Section 2; George Walter Prothero, Class III., Section 3; Eduard Seler, Class III., Section 2.

The following communication was presented:—

William J. Cunningham, "The Problem of Railroad Consolidation in New England."

Two papers were presented by title:—

"Lichenes in Insula Trinidad a Professore R. Thaxter Collecti," by Edward A. Vainio, presented by Roland Thaxter.

"Some New Fossil Parasitic Hymenoptera from Baltic Amber," by C. T. Brues.

The meeting dissolved at 9.50 P.M.

One thousand one hundred and twentieth Meeting.

FEBRUARY 14, 1923.— STATED MEETING.

The Academy met at its House at 8.25 P.M.

The PRESIDENT in the Chair.

There were twenty-three Fellows present.

The Minutes of the meeting of January 10, 1923, were read and approved.

The Corresponding Secretary reported the receipt of a biographical notice of William Stewart Halsted, by Harvey Cushing.

On recommendation of the Council, it was

Voted, To make a supplementary appropriation of $250 for the current year from the General Fund, in accordance with the action appointing Mrs. Holden, Assistant Librarian Emerita.

It was unanimously

Voted, To amend Paragraph 4 of the Standing Votes, so that it now reads:—

4. The Council, under such rules respecting nominations as it may prescribe, may elect as Associates of the Academy a limited number of men of mark in affairs or of distinguished service in the community.

Associates shall be entitled to the same privileges as Fellows, but shall not have the right to vote.

The admission fee and annual dues of Associates shall be the same as those of Fellows residing within fifty miles of Boston.

It was suggested that biographical notices in the cases of such Associates would not be required.

The President announced the death of Edward Emerson Barnard, Fellow in Class I., Section 1.

The following communications were presented:—

George LaPiana, "The Form of the Earth in the Middle Ages."

Waldemar Lindgren, "Geological Fieldwork in Arizona, Mexico, and South America," with lantern slide illustrations.

One paper was presented by title:—

"A Revision of the Atomic Weight of Silicon. The Analysis of Silicon Tetrachloride and Tetrabromide," by Gregory P. Baxter, Philip F. Weatherill and Edward W. Scripture, Jr., presented by G. P. Baxter.

The meeting dissolved at 10.25 P.M.

One thousand one hundred and twenty-first Meeting.

MARCH 14, 1923.— STATED MEETING.

The Academy met at its House at 8 P.M.

The PRESIDENT in the Chair.

There were forty Fellows and several guests present.

In the absence of the Corresponding Secretary, the Recording Secretary was requested to assume his duties.

The Transactions of the last meeting were read and approved.

The President announced the deaths of the following Fellows:— Edward Williams Morley, Class I., Section 3; John Trowbridge, Class I., Section 2; and of one Foreign Honorary Member, Heinrich Brunner, Class III., Section 1.

On recommendation of the Council, the following appropriations were made for the ensuing year:—

From the income of the General Fund, $9,500, to be used as follows:—

for General and Meeting expenses	$1,200.00
for Library expenses	2,800.00
for Books, periodicals and binding	1,200.00
for Assistant Librarian Emerita	500.00
for House expenses	2,500.00
for Treasurer's expenses (including five insurance premiums due this year)	1,200.00
at the disposition of the President	100.00

From the income of the Publication Fund, $3,368.62, to be used for publication.

From the income of the Rumford Fund, $3,832.49, to be used as follows:—

for Research	$1,000.00
for Books, periodicals and binding	200.00
for Publication	600.00
for use at the discretion of the Committee	2,032.49

On recommendation of the Council, it was

Voted, To make a supplementary appropriation from the General Fund of $300, to be used for the purchase of Books and Periodicals and for Binding, for the present year, 1922–23.

An amendment to the Statutes was proposed to bring them into conformity with the changes recently made in the Statutes and Standing Votes, striking out all references to Resident Associates. The amendment was adopted, twenty-three votes in the affirmative, none in the negative.

The President appointed the Nominating Committee as follows:

Desmond FitzGerald, of Class I.

Edward M. East, of Class II.

Kirsopp Lake, of Class III.

The following communications were presented:—

George W. Pierce, "Demonstration of Radio-telephony."

Charles T. Brues, "Insects Preserved in Baltic Amber, with remarks on other Tertiary Insects," with lantern slide illustrations.

Three papers were presented by title:—

"The Chilean Species of Metzgeria," by Alexander W. Evans.

"The Typical Shape of Polyhedral Cells in Vegetable Parenchyma and the Restoration of that Shape Following Cell Division," by Frederic T. Lewis.

"The Effect of Pressure on Optical Absorption," by Frances G. Wick, presented by P. W. Bridgman.

The meeting dissolved at 10 o'clock, and was followed by a concert by Radio-telephony.

One thousand one hundred and twenty-second Meeting.

APRIL 6, 1923.— OPEN MEETING.

A Reception was held at the House of the Academy from four to six o'clock, in honor of Sir Joseph John Thomson, of Cambridge, England, who was in this country as the guest of the Franklin Institute of the State of Pennsylvania, and was accompanied by Vice-President W. C. L. Eglin and Secretary R. B. Owens of the Institute.

There were about two hundred Fellows and guests, including ladies, present.

Tea was served in the Reception Room on the third floor.

One thousand one hundred and twenty-third Meeting.

APRIL 11, 1923.— STATED MEETING.

The Academy met at its House at 8 P.M.

The PRESIDENT in the Chair.

There were twenty-three Fellows and one Foreign Honorary Member present.

In the absence of the Recording Secretary, the Corresponding Secretary was requested to assume his duties.

The Transactions of the last meeting were read and approved.

The following communications were presented:—

Henry H. Clayton, 1. "Variations in Solar Radiation and the Weather," with lantern slide illustrations. 2. "Evidences of Tidal Strains in the Solar Atmosphere possibly due to Planetary Attraction."

William M. Davis, "The Marginal Belts of the Coral Seas."

The meeting was dissolved at 10 P.M.

One thousand one hundred and twenty-fourth Meeting.

MAY 9, 1923.— ANNUAL MEETING.

The Academy met at its House at 8 P.M.

The PRESIDENT in the Chair.

There were forty-two Fellows and several guests present.

The Transactions of the last meeting were read and approved.

The President announced the death of George Lincoln Goodale, Fellow in Class II., Section 2.

The Corresponding Secretary reported the receipt of a biographical notice of M. P. Knowlton, by Wm. C. Wait.

On recommendation of the Council, it was

Voted, That the President be authorized to appoint delegates to represent the Academy at the July meeting in London of the Royal Asiatic Society.

On recommendation of the Council, the following appropriation was made for 1923–24:

From the income of the C. M. Warren Fund, $1,072.00, for use at the discretion of the Committee.

It was

Voted, To refer to a committee for report in the autumn the following proposed amendment to the Statutes:— Addition to Chapter II, Art. 5,

"Any Fellow shall also be exempt from annual dues who has paid such dues for forty years, or, having attained the age of seventy-five, has paid dues for twenty-five years."

The following report of the Council was presented:—

Since the last report of the Council, there have been reported the deaths of fifteen Fellows: — Edward Emerson Barnard, Alexander Graham Bell, John Casper Branner, Henry Herbert Edes, Harold Clarence Ernst, George Lincoln Goodale, William Stewart Halsted, Henry Marion Howe, Edward Williams Morley, Edward Hall Nichols, Thomas Nelson Page, Alexander Smith, John Trowbridge, Williston Walker, Robert Wheeler Willson; and seven Foreign Honorary Members: — Heinrich Brunner, Friedrich Delitzsch, Albert Venn Dicey, Hermann Diels, Henry Jackson, George Walter Prothero, Eduard Seler.

Nineteen Fellows and four Foreign Honorary Members were elected by the Council and announced to the Academy in May 1922. One Fellow has declined election.

The roll now includes 572 Fellows and 64 Foreign Honorary Members (not including those elected in April 1923).

The annual report of the Treasurer, Harold Murdock, was read, of which the following is an abstract:—

GENERAL FUND.

Receipts.

Balance, April 1, 1922	$7,037.54	
Investments	4,536.34	
Assessments	3,400.00	
Admissions	130.00	
Rumford Fund for payment in 1922 in error	27.56	
Sundries	248.40	$15,379.84

Expenditures.

Assistant Librarian Emerita	$250.00	
Expenses of Library	4,627.57	

Assistant Treasurer	$250.00	
Treasurer's Expenses	456.89	
Expense of House	2,819.70	
General Expenses	1,099.55	
President's Expenses	80.00	
Biographical Notices	64.24	
Transferred to Publication Fund	1,500.00	
Interest on Bonds	146.54	
Income transferred to principal	367.23	$11,661.72
Balance, April 1, 1923		3,718.12
		$15,379.84

RUMFORD FUND.

Receipts.

Balance, April 1, 1922	$5,929.22	
Investments	4,131.51	
Sale of Publications	39.06	
Sale of Spectrometer	50.00	$10,149.79

Expenditures.

Research	$1,775.00	
Books, periodicals and binding	204.10	
Publications	1,317.03	
Table of Constants	200.00	
Interest on Mortgage	10.39	
Income transferred to principal	189.55	$3,696.07
Balance, April 1, 1923		6,453.72
		$10,149.79

C. M. WARREN FUND.

Receipts.

Balance, April 1, 1922	$2,402.06	
Investments	1,105.42	$3,507.48

Expenditures.

Research	$1,250.00	
Vault rent, part	3.00	
Interest on Bonds and Stock bought	70.42	
Charged to cancel premium on Bonds	150.00	
Income transferred to Principal	51.86	$1,525.28
Balance, April 1, 1923		1,982.20
		$3,507.48

PUBLICATION FUND.

Receipts.

Balance, April 1, 1922	$5,120.13	
Appleton Fund Investments	1,618.13	
Centennial Fund Investments	2,428.85	
Authors' Reprints	159.55	
Sale of Publications	600.35	
General Fund Income	1,500.00	$11,427.01

Expenditures.

Publications	$4,579.13	
Vault Rent, part	10.00	
Interest on Bonds bought	80.94	
Charged to cancel premium on Bonds	175.00	
Income transferred to Principal	207.99	$5,043.06
Balance, April 1, 1923		6,383.95
		$11,427.01

FRANCIS AMORY FUND.

Receipts.

Investments	$1,646.17	

Expenditures.

Publishing statements	$62.95	
Interest on Bonds bought	23.38	

Charged to cancel premium on Bonds . . .	$213.75	
Income transferred to Principal	1,346.09	$1,646.17

The following Reports were also presented:—

REPORT OF THE LIBRARY COMMITTEE.

The Librarian begs to report for the year 1922–1923, as follows:—

During the year 75 volumes and 18 unbound numbers of periodicals have been borrowed by 33 persons, including 27 Fellows and 6 libraries. Many books have been consulted and used at the library. All books taken out have been returned or satisfactorily accounted for.

The number of books on the shelves at the time of the last report was 38,411. During the year, 672 volumes have been added, making the number now on the shelves 39,083. This includes 94 purchased from the General Fund, 27 from the Rumford Fund, and 551 received by gift or exchange. The number of pamphlets added was 439.

The expenses charged to the library during the financial year are:

Salaries	$3,221.25
Binding:—	
General Fund	1,049.70
Rumford Fund	54.10
Purchase of periodicals and books:—	
General Fund	327.08
Rumford Fund	122.44
Miscellaneous	29.54

The library has suffered a severe loss in the death of Miss Wyman, the new assistant librarian, who was taken ill in April 1922, and died in little over two months. The librarian desires to put on record his appreciation of the excellence of her services. After some searching a very desirable candidate was found in Mrs. W. G. Ball, who was appointed assistant librarian, from October first, and has begun her work most auspiciously. Mrs. Smith carried on during June and July, and has been placed in the status of part-time assistant. Mrs. Holden, who served us so long and faithfully, has been by vote of the Academy provided with a moderate pension.

A. G. WEBSTER, *Librarian.*

May 9, 1923.

Report of the Rumford Committee.

The Committee organized on October 11, 1922, by electing Theodore Lyman to be Chairman and Arthur G. Webster, Secretary.

The following grants in aid of researches in light and heat have been made during the academic year 1922–1923:

October 11, 1922. To Professor W. W. Campbell of the Lick Observatory for the purpose of installing a coarse grating to cover the upper end of the Crossley reflecting telescope at the Lick Observatory $475

To Professor A. G. Webster of Clark University in further aid of his researches in the Thermodynamic Problems of Interior Ballistics 500

To Professor Norton A. Kent of Boston University for the continuation of his researches on the Constitution of Spectral Lines 150

December 13, 1922. To Professor John R. Roebuck of the University of Wisconsin for the procuring of porous plugs for the Joule-Kelvin Experiment 125

February 14, 1923. To Professor Wm. Duane an additional grant (to No. 239) for the continuation of his researches on the Heat Energy of Electrons 200

Reports of Progress in their respective researches have been received from the following persons:— R. T. Birge (research finished), P. W. Bridgman, A. L. Clark, F. Daniels, A. L. Foley, P. F. Gaehr, R. C. Gibbs, H. P. Hollnagel, H. L. Howes, L. R. Ingersoll, N. A. Kent, F. E. Kester, E. Kremers, C. L. Norton, F. Palmer, Jr., J. A. Parkhurst, H. M. Randall, T. W. Richards, F. K. Richtmyer, F. A. Saunders, A. W. Smith, B. Spence, L. S. E. Thompson (research finished), O. Tugman (research finished), F. W. Very, A. G. Webster, F. G. Wick, R. W. Wood.

The following papers in the Proceedings have been published with aid from the Rumford Fund since the presentation of the last Report of this Committee:

Atmospheric Attenuation of Ultra-Violet Light, E. R. Schaeffer, Vol. 57, No. 14.

The Ratio of the Calorie at 73° to that at 20°, Arnold Romberg, Vol. 57, No. 15.

Vision and the Technique of Art, A. Ames, Jr., C. A. Proctor and Blanche Ames, Vol. 58, No. 1.

The Compressibility of Thirty Metals as a Function of Pressure and Temperature, P. W. Bridgman, Vol. 58, No. 5.

The following paper has been approved for publication: The Effect of Pressure on Optical Absorption, Frances G. Wick.

A sum not to exceed $478 was granted toward the expense of publication of a paper by A. Ames, Jr., C. A. Proctor and Blanche Ames, on Vision and the Technique of Art.

THEODORE LYMAN, *Chairman.*

May 9, 1923.

REPORT OF THE C. M. WARREN COMMITTEE.

The Committee had at its disposal at the beginning of the fiscal year 1922–23, $3,368.47. During the year ending March 31, 1923, grants to the amount of $1,250.00 were made. The balance on that date was $2,118.47.

At a meeting of the Committee held April 14, 1923, it was voted to request the Treasurer to invest $1,000.00 of the accumulated income and to add this amount to the principal of the fund.

Grants have been made during the year ending April 1, 1923, as follows:

May 4, 1922.— To Prof. Charles James, New Hampshire College, $500.00 to be applied toward an investigation of the Ytterbium earths.

May 4, 1922.— To Prof. Charles A. Kraus, Clark University, $500.00 to continue his work on the constitution of metallic substances.

Dec. 8, 1922.— To Prof. James B. Conant, Harvard University, $250.00 to be used in a research on the electrochemical study of the reversible reduction of organic compounds.

At a meeting of the Committee held April 9, 1923, the following grants were made:

To Prof. David E. Worrall of Tufts College, $250.00 to aid a research on the chemistry of mustard oils.

To Prof. R. R. Renshaw, New York University, $200.00 to be used in the study of the physiological activity of choline and its derivatives.

Reports of investigations aided by grants made by the Committee have been recently published by Professors Conant, Hibbert, James, Kraus and Willard.

A potentiometer bought with money granted by the Committee to Prof. H. H. Willard has recently been returned to the Chairman and lent to Prof. R. R. Renshaw. It is planned to have all apparatus of a general nature returned so that it can be used in a number of researches.

JAMES F. NORRIS, *Chairman.*

May 9, 1923.

REPORT OF THE PUBLICATION COMMITTEE.

During the twelve months since the publication of the last report there have been printed Nos. 11–18, inclusive, of Vol. 57 of the Proceedings, and Nos. 1–8 of Vol. 58. Vol. 57 contains the largest number of papers, though not the largest number of pages printed, since the issuance of Vol. 48 (1912–13), and the current volume will be nearly as large.

Sales of publications remain at a very satisfactory figure.

The financial statement follows:

Receipts.

Balance, April 1, 1922	$6,003.69	
Appropriation	3,951.95	
Sales of publications	600.35	
Received for authors' reprints	159.55	$10,715.54

Expenses.

Engraving, printing and binding	$4,439.64	
Cartage and mailing	113.87	
Committee's expenses	15.62	$4,569.13
Balance, April 1, 1923		$6,146.41

The above figures do not include the sum of $1,317.03 received from the Rumford Committee for publication of Rumford papers.

Respectfully submitted,

LOUIS DERR, *Chairman.*

May 9, 1923.

REPORT OF THE HOUSE COMMITTEE.

The House Committee submits the following report for 1922–23:—

With the balance of $125.44 left from last year, an appropriation of $2,700, and $110 received from other societies for the use of the rooms, the Committee has had at its disposal the sum of $2,935.44. The total expenditure has been $2,929.70, leaving an unexpended balance on April 1, 1923, of $5.74. The expenditure has been as follows:—

Janitor		$925.00
Electricity	A. Light	180.98
	B. Power	69.00
Coal		1,015.48
Care of Elevator		51.50
Gas		54.93
Water		18.48
Telephone		74.02
Upkeep		39.36
Ash Tickets		31.68
Furnishings		352.45
Janitor's Materials and Sundries		116.82
Total Expenditure		$2,929.70

The amount of $110 contributed by other societies for the use of the building leaves the net expense of the House $2,819.70.

Meetings have been held as follows:—

The Academy	
Stated Meetings	8
Open Meetings	1
American Antiquarian Society	1

Archæological Institute	1
Colonial Dames	1
Colonial Society	4
Geological Club of Boston	3
Harvard-Technology Chemical Club	5
New England Botanical Club	3
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The rooms on the first floor have been used for Academy Council and Committee meetings, and also by the Colonial Society, the Trustees of the Children's Museum, and the Thursday Evening Club.

During Convocation Week of the American Association for the Advancement of Science, December 26–30, the Academy kept open house for the members of the Association, tea being served each afternoon.

Respectfully submitted,

JOHN OSBORNE SUMNER, *Chairman.*

May 9, 1923.

On recommendation of the Treasurer, it was

Voted, That the Annual Assessment be $10.00.

The annual election resulted in the choice of the following officers and committees:

GEORGE F. MOORE, *President.*
ARTHUR E. KENNELLY, *Vice-President for Class I.*
WILLIAM M. WHEELER, *Vice-President for Class II.*
ARTHUR P. RUGG, *Vice-President for Class III.*
HARRY W. TYLER, *Corresponding Secretary.*
CHARLES B. GULICK, *Recording Secretary.*
HAROLD MURDOCK, *Treasurer.*
ARTHUR G. WEBSTER, *Librarian.*

Councillors for Four Years.

GEORGE F. SWAIN, *of Class I.*
IRVING W. BAILEY, *of Class II.*
JEREMIAH D. M. FORD, *of Class III.*

Finance Committee.

ARTHUR LORD, THOMAS BARBOUR, PAUL J. SACHS.

Rumford Committee.

THEODORE LYMAN, LOUIS BELL,
ARTHUR G. WEBSTER, PERCY W. BRIDGMAN,
ELIHU THOMSON, HARRY M. GOODWIN,
CHARLES L. NORTON.

C. M. Warren Committee.

JAMES F. NORRIS, WALTER L. JENNINGS,
HENRY P. TALBOT, ARTHUR D. LITTLE,
GREGORY P. BAXTER, LAWRENCE J. HENDERSON,
FREDERICK G. KEYES.

Publication Committee.

LOUIS DERR, *of Class I.*
HERBERT V. NEAL, *of Class II.*
ALBERT A. HOWARD, *of Class III.*

Library Committee.

HARRY M. GOODWIN, *of Class I.*
THOMAS BARBOUR, *of Class II.*
WILLIAM C. LANE, *of Class III.*

House Committee.

JOHN O. SUMNER,
WM. STURGIS BIGELOW, ROBERT P. BIGELOW.

Committee on Meetings.

THE PRESIDENT, GEORGE H. PARKER,
THE RECORDING SECRETARY, EDWIN B. WILSON,
EDWARD K. RAND.

Auditing Committee.

GEORGE R. AGASSIZ, JOHN E. THAYER.

The Council reported that the following gentlemen were elected members of the Academy:—

Class I., Section 1 (Mathematics and Astronomy):
Samuel Alfred Mitchell, of University, Virginia, as Fellow.
Oswald Veblen, of Princeton, New Jersey, as Fellow.
Class I., Section 3 (Chemistry):
Tenney Lombard Davis, of Cambridge, as Fellow.
Duncan Arthur MacInnes, of Cambridge, as Fellow.
Class I., Section 4 (Technology and Engineering):
William Hovgaard, of Cambridge, as Fellow.
James Robertson Jack, of Cambridge, as Fellow.
William Henry Lawrence, of Boston, as Fellow.
Samuel Wesley Stratton, of Cambridge, as Fellow.
Edward Pearson Warner, of Cambridge, as Fellow.
Class II., Section 2 (Botany):
Joseph Charles Arthur, of Lafayette, Indiana, as Fellow.
Elvin Charles Stakman, of St. Paul, Minnesota, as Fellow.
Class II., Section 3 (Zoölogy and Physiology):
Manton Copeland, of Brunswick, Maine, as Fellow.
George Albert Boulenger, Brussels, as Foreign Honorary Member.
Class II., Section 4 (Medicine and Surgery):
Roger Irving Lee, of Cambridge, as Fellow.
Hans Zinsser, of Boston, as Fellow.
Class III., Section 1 (Philosophy and Jurisprudence):
Leslie Colby Cornish, of Augusta, Maine, as Fellow.
Class III., Section 2 (Philology and Archæology):
Henri Guy, of Grenoble, as Foreign Honorary Member.
Class III., Section 3 (Political Economy and History):
Carl Lotus Becker, of Ithaca, New York, as Fellow.
Michael I. Rostovtzeff, of Madison, Wisconsin, as Fellow.

The following communication was presented:—

Edwin B. Wilson, "Statistics."

The following papers were presented by title:—

"An Example in Potential Theory," by O. D. Kellogg.

"Mitochondrial Bodies in the Spermatogenesis of Chorthippus curtipennis (Scudd.)," by E. L. Mark and L. C. Wyman.

"Trajectory Surfaces and a Generalization of the Principal Directions in any Space," by Joseph Lipka.

The Meeting was dissolved at 10.10 P.M.

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JOEL ASAPH ALLEN (1838–1921).

Fellow in Class II, Section 3, 1871.

The American Academy of Arts and Sciences was the first learned society to recognize the scientific worth of Joel Asaph Allen.

The young man had come to Cambridge to study with Agassiz. He had been a member of the famous expedition to Brazil; he had made collecting trips into the Middle West, and into Florida, and had published some thirty or more scientific papers. This was fifty years ago. On the year of his election he was made "Assistant" in the Museum of Comparative Zoölogy, and assigned to work on the Plains, and in the Rocky Mountains. He did pioneer work in these regions, where the buffalo were "so numerous on one occasion that they darkened the plains as far as the eye could reach," and where he witnessed sanguinary engagements between Custer and the Sioux.

Having collected an enormous amount of zoölogical material he became absorbed in "working up" scientific collections, either those which he himself had made or which came to him because of his genial and sympathetic nature from other collectors.

Although of frail physique, his powers of concentration were most exceptional. While at work he seemed to live in another world, unconscious of those about him and absolutely preoccupied with the task he had undertaken. He labored daily to the point of exhaustion, and looked upon rest only as a means of obtaining the necessary energy for an additional day of devotion to his dominating interest.

In 1885 he left the neighborhood of Boston and of Cambridge to assume the duties of Curator of the Department of Ornithology and Mammalogy at the American Museum of Natural History. Here he rounded out and completed his life work. During his incumbency exploring expeditions were sent into all parts of America, into Europe, Asia, Africa, the Islands of the Pacific, Arctica and Antarctica. The collections of mammals and birds increased from a paltry fifteen hundred to upwards of a quarter of a million specimens. He described between five and six hundred new species of mammals, and his published scientific papers aggregated nearly fifteen hundred titles.

Conscious of his own "timidity" in the presence of strangers, em-

barrassed before audiences, men were drawn to him because of his sterling worth, and honors were generously awarded him because of the value of his scientific papers. His election to Fellowship in this Academy was followed by membership in no less than thirty scientific and learned societies.

In his autobiography which appeared only a few years before his death, referring to his youth, he wrote; "All I aspired to was opportunity for scientific research, believing that diligence, singleness of purpose, and honest work would bring its own reward." His aspirations were amply fulfilled and diligence, singleness of purpose, and honest work certainly brought their own reward.

HERMON C. BUMPUS.

WILLIAM STEWART HALSTED (1852–1922).

Fellow in Class II, Section 4, 1901.

Professor Halsted, certainly one of the most cultivated, and regarded by many as the most eminent surgeon of his time, in view of the character of his contributions, died at noon on Thursday, the seventh of September, in the Johns Hopkins Hospital, of which he had been surgeon-in-chief since soon after its opening. At that time, in 1889, neither he nor his clinical colleagues, Osler and Kelly, had as yet turned forty.

A man of unique personality, shy, something of a recluse, fastidious in his tastes and in his friendships, an aristocrat in his breeding, scholarly in his habits, the victim for many years of indifferent health, he nevertheless was one of the few American surgeons who may be considered to have established a school of surgery, comparable, in a sense, to the school of Billroth in Vienna. He had few of the qualities supposed to accompany what the world regards as a successful surgeon. Over-modest about his work, indifferent to matters of priority, caring little for the gregarious gatherings of medical men, unassuming, having little interest in private practice, he spent his medical life avoiding patients — even students, when this was possible — and, when health permitted, working in clinic and laboratory at the solution of a succession of problems which aroused his interest. He had that rare

form of imagination which sees problems, and the technical ability combined with persistence which enabled him to attack them with promise of a successful issue. Many of his contributions, not only to his craft but to the science of medicine in general, were fundamental in character and of enduring importance.

As a schoolboy at Phillips-Andover and as an undergraduate at Yale, he was prominent in sports rather than in the class-room, and in his senior year was captain of one of the early university football teams. Like many other young men his ambition was not fired until his entrance into a professional school, and when, after his graduation in 1874, he entered the College of Physicians and Surgeons (Columbia) in New York, he settled down to prove his mettle with the result that three years later, on getting his degree, he was awarded a prize for leading his class in scholarship. After serving as interne at Bellevue he was appointed house physician to the newly erected New York Hospital. Subsequently, two years were passed in Europe where he devoted himself more especially to the subjects of anatomy and embryology. He studied at Vienna, Leipzig and Würtzburg, and his later surgical trend and investigative proclivities were distinctly colored by the German and Austrian surgery of the day.

On his return from abroad in 1880, he was made assistant demonstrator and subsequently demonstrator of anatomy at the College of Physicians and Surgeons. He also held a number of hospital positions, first at the Charity Hospital where from 1881 to 1887 he was an attending surgeon and director of the out-patient department. For three years he was also surgeon-in-chief to the Emigrant Hospital, Ward's Island; and later, from 1885 to 1887, an attending surgeon to both the Bellevue and Presbyterian Hospitals. During this period in New York, following his return from abroad, he supported himself mainly by teaching, and with Dr. George E. Munroe he organized a famous extramural course for students, consisting of practical exercises in the laboratory and at the bedside, to take the place of the time-honored quizzes which it was long the fashion for the New York students with hospital aspirations to attend.

During his last few years in New York he undertook an anatomico-surgical investigation on the anæsthetizing effect of the then little-known and newly introduced drug, cocaine. In this research, which had been begun in 1885, he was the first to utilize for surgical purposes

the principle of nerve blocking, and was accustomed to demonstrate to dentists how painless extractions or even more extensive operations on the jaws might thus be carried out. He was the first, also, at this time, to demonstrate spinal anæsthesia by introducing the drug into the lumbar meninges. In the course of these studies he used himself as a subject, injecting his own peripheral nerves in order to map out the areas of anæthesia, and, unaware of the danger he was running, contracted an habituation to the drug, from which, with the help of a devoted professional friend, he effectually broke himself.

It was natural enough that cocaine was subsequently abhorred by him, and after Schleich's solution came to be generally employed as a local anæsthetic, he usually preferred to infiltrate with salt solution alone, which has certain anæsthetizing properties, rather than use even the diluted drug. Fifteen years later when the writer of this note, as Dr. Halsted's resident surgeon, stumbled anew upon the principle of nerve blocking for operations on hernia and published a paper on the subject, he was utterly unaware that his chief had ever made studies with cocaine of any sort, so reticent was he about this particular matter and so little did questions of priority interest him. It has remained for the dentists to call attention to his original work on regional anæsthesia, and a few months before his death they made due public acknowledgment of what Dr. Halsted himself had never laid claim to, and the knowledge of which he had even withheld, at least until recent years, from his house officers.

Before this tragic episode interrupted what would doubtless have been a brilliant career in New York, he had published a number of papers which showed promise of his technical gifts and abilities as an investigator, but it was not until he was brought to Baltimore in the late eighties by William H. Welch and got to work in the original pathological building there with Franklin P. Mall, Councilman, Flexner and others, that his unusual capacity for research was shown at its full worth.

The studies of compensatory thyroid hypertrophy, one of his early researches, published in the first volume of the Johns Hopkins Hospital Reports, remained for twenty years the basis of our views regarding exophthalmic goitre as an expression of functional overactivity. The correctness of his observations and interpretation of them, indeed, remained unquestioned until he himself repeated the experiments and,

failing to corroborate his original results, promptly reported the fact before one of the biological societies. It was a striking example of his scientific honesty, and it remained for someone else to point out, on the basis of new facts relating to iodine, how it was that his original interpretation had been nearer the truth than his later one.

Another of his early studies was on intestinal resection and suture, and he introduced a method of anastomosis of the bowel, based on the distribution of the blood supply and on the correct placement of the sutures, far superior to that of any of his predecessors. These two subjects, the surgery of the thyroid and intestine, continued to engage his attention to the end, and among his last publications was a monograph entitled "The Operative Story of Goitre" published two years before his death; and another on the bulkhead principle of intestinal anatomosis.

His interest lay not in the number of cases he might operate upon but in working at certain principles of surgery, and in the course of his experiments upon the thyroid and parathyroid bodies, he hit upon what is known as Halsted's Law, namely, that "a transplant of a portion of a ductless gland will survive only when a physiological deficit has been produced."

On the opening of the hospital in 1889 he turned his attention to questions of technique, and was among the first American surgeons to grasp fully the principle of the new aseptic surgery. The introduction of silver as suture material and as a covering for wounds because of its bactericidal qualities was due to him. He studied the healing of an aseptic blood-clot in closed wounds. He introduced gutta-percha in the form of "protective" as a dressing for open wounds. He showed how silk could be safely buried in the tissues, an important principle many surgeons are incapable of learning. He was among the first to insist upon absolute blood-stilling in the course of operations in days when operations were bloody affairs, and he introduced the form of delicate pointed forceps for hæmostosis now universally in use. He also introduced rubber gloves into surgery in the early nineties, and, being himself a painstaking rather than a brilliant or spectacular operator, it was long before gloves came into use in other clinics — indeed, for years they were very much scoffed at as clumsy impediments to manipulation.

His operation for cancer of the breast revolutionized the treatment

of these cases, and the same might be said of his hernia operation, though in this he shared the honors with Bassini, an Italian, who introduced a high inguinal operation with repair of the canal at about the same time. In the late nineties his attention was chiefly centered upon the diseases of the gall-bladder and its ducts, and the early radical operation on the common duct emanated from his clinic. Possibly few men in the country knew more than did he about the condition from which he was destined to succumb — a stone in the ampulla of Vater.

In later years he devoted himself chiefly to studies relating to the blood-vessels and evolved a method whereby in cases of aneurysm the major trunks could be slowly constricted, and in this as in all other subjects which his studies illuminated, his inventive genius was displayed, as well as his thorough knowledge of anatomy and pathology. He was the first successfully to ligate the left subclavian artery in its first portion for aneurysm and the only surgeon who is recorded to have performed this rare procedure twice.

Halsted's honors were many. In 1900 at the centennary of the Royal College of Surgeons of England he, with J. C. Warren of Boston, W. W. Keen of Philadelphia, and Robert F. Weir of New York, were the four Americans chosen to receive an honorary fellowship. A few years later he was made an F. R. C. S. of Edinburgh, and also an LL.D. both of Edinburgh and of his alma mater, Yale. Columbia gave him a D.Sc. and he was a member of the National Academy of Sciences as well as of many other foreign and American scientific bodies. Though his publications were comparatively few — rarely more than one or two a year — he wrote well and painstakingly, and many of his papers will remain among our surgical classics. The one surgeon he perhaps admired more than any other was the late Theodore Kocher of Berne, Switzerland, and the two men, in manner and methods surgical, in imagination and ideals, had very much in common. Both of them held their professorships for an unusual number of years — Kocher for forty-five years, Halsted for thirty-three.

Halsted was a man who taught by example rather than precept. He was a safe, fastidious and finished surgeon, by no means a brilliant and showy operator after the style cultivated by many of his contemporaries. He cared nothing for administration, and up to ten years ago at least, his staff never met as a body. He was not a successful

teacher of undergraduates. A bed-to-bed ward visit was almost an impossibility for him. If he was interested he would spend an interminable time over a single patient, reviewing the history, taking notes, having sketches made, carrying the problem to the laboratory and perhaps working on it for weeks. Meanwhile his associates and assistants would run his clinic as best they could. In this way his school developed — none of his pupils after his own fashion, to be sure — it would have been impossible to imitate him — all of them, nevertheless, influenced enormously by his attitude toward surgery, and by his operative methods.

His loss to the Johns Hopkins Hospital which he served so faithfully and long, and to which he bequeathed his property, will be irreparable. It will be equally so to his many and devoted disciples. One of his long series of resident-surgeons, who, as others have done, came to know him better after leaving his service, just as many sons learn to know their fathers not until after they have grown up, has in all respect and affection written this inadequate note of appreciation.

"Who knows whether the best of men be known, whether there be not more remarkable persons forgot than any that stand remembered in the known account of time?"

HARVEY CUSHING.

MARCUS PERRIN KNOWLTON (1839–1918).

Fellow in Class III, Section 1, 1911.

Marcus Perrin Knowlton, son of Merrick and Fatima (Perrin) Knowlton, was born in Wilbraham, Massachusetts, February 3, 1839. Little is known of his boyhood. He is remembered as an earnest student at Munson Academy where he received his early instruction. He took high rank in his class of 1860 at Yale. He depended largely upon his own exertions to meet the expenses of his education. He taught at Westfield and in the Hopkins Grammar School at New Haven, and, for a short time after his graduation from Yale, he was principal of the Union School at Norwalk, Connecticut. The destruction of this school by fire and the consequent interruption of his occu-

pation, gave the immediate impetus to his study of the law as a profession.

He began at the office of James G. Allen, at Palmer, but soon removed to the offices of Wells and Soule in Springfield, where, under these distinguished lawyers — both later to be Justices of the great court upon which he also was to sit — he rapidly mastered the principles of the English law.

On September 24, 1862, he was admitted to the bar, after the oral examination customary at that time — in his case largely a perfunctory ceremony so well was his capacity recognized. He immediately began practice by himself at Springfield, but within two years formed the partnership of Knowlton and Greene, soon to be superseded by the distinguished law firm of Stearns & Knowlton. George L. Stearns, the senior partner, was a leading lawyer of western Massachusetts, a great jury advocate, differing in numberless ways from his staid junior. The two complemented each other remarkably, and Stearns & Knowlton prospered. It became the leading law firm of the state west of Worcester.

His devotion to the law and the interests of his clients was not allowed to stand in the way of service to the community. Mr. Knowlton served his city in its city council, and his district in the great and General Court of Massachusetts, where he became a member of the House in 1878 and later, in 1880 and 1881, of the Senate. A republican of earnest conviction, wide information, and sound judgment, he imbued his fellow legislators with firm belief in his great capacity. Governor Long, who had served with him in the legislature and recognized his ability as man and lawyer, appointed him an Associate Justice of the Superior Court, and he was commissioned on August 31, 1881, to succeed Judge William Allen.

Judge Knowlton in the six years of his service in the Superior Court impressed the bar, the jurors in attendance when he presided, and the litigants whose causes came before him, with his courtesy, his patience, his comprehensive grasp alike of the theoretical law and of the practical common sense involved in a sound determination, his ability to state clearly the issues of fact and of law, and, above all, his absorbing desire to secure their respective rights to all parties. His appointment to the Supreme Judicial Court, which came from Governor Ames, September 14, 1887, to fill the vacancy caused by the resigna-

tion of Judge Gardner, was the natural recognition by the Commonwealth of his desert, and of its desire to profit still further from the service of this gifted son. He first sat with the court at Greenfield on September 20, 1887; and his first opinion came down on October 20, 1887, in the case of *O'Keefe v. Northampton*, reported in 145 Mass. 115. Other opinions followed rapidly. Fifteen opinions from his pen occur in the first volume of reports issued after his appointment. They are full, clear, simply stated, broad-minded, and sensible, and they cover a wide range of subjects. His decisions grew in force with the passing years; but, throughout, they are characterized by wide knowledge of law, sound common sense, wise consideration of the ultimate consequences of the principles laid down, and keen sense of justice, expressed in clear, simple and forceful words, logical, coherent, persuasive and convincing.

On December 8, 1902, Chief Justice Holmes vacated his office by becoming a Justice of the Supreme Court of the United States, and on December 17 Governor Crane appointed Judge Knowlton to be Chief Justice. Massachusetts has had many able Chief Justices, but only Chief Justice Shaw would be ranked higher by the consensus of lawyers than Chief Justice Knowlton.

His industry was enormous. He wrote the opinion of the court in eight hundred thirty-seven cases as an Associate Justice and in seven hundred thirty-three as Chief Justice. He wrote also twenty-nine dissenting opinions, of which four were written while Chief Justice. It is worth remarking that the law as contended for by him in most of these dissenting opinions was eventually established as the law of the Commonwealth. He was fair and open-minded in the consideration of a legal problem. His conclusion was the result of sound, logical processes of thought; and, once reached, was not easily abandoned. He had the courage of his convictions, the rock-ribbed determination which is the result, not of prejudice, but of conscientious, painstaking, laborious thought.

Only Chief Justice Shaw has exceeded him in the number of his written opinions; twenty-one hundred sixty-one in thirty years, as against fifteen hundred ninety-nine in twenty-four years.

His last opinion was *Ryan v. Boston Elevated Railway*, 209 Mass. 292. Thus his writings extend through sixty-five volumes of Massachusetts reports.

He resigned from his office September 7, 1911, owing to failing eyesight.

Fortunately this trouble with his eyes was overcome, and he was called upon for still further service to Massachusetts as Chairman of the trustees appointed to preserve and rehabilitate the Boston and Maine Railroad.

For many years he was one of the trustees of Munson Academy and his early school was an object of his affectionate thought and care.

He was a faithful attendant at the services of the Church of the Unity at Springfield, interested in the religious work of the society.

He received the degree of LL.D. from Yale, from Harvard and from Williams.

He died May 7, 1918, at Springfield.

His school, his college, his city and his state delighted to honor him; and to them all he gave the loyal service of a devoted and exceptionally able son.

WILLIAM C. WAIT.

HARMON NORTHROP MORSE (1848–1920).

Fellow in Class I, Section 3, 1914.

Professor Morse was born at Cambridge, Vermont, October 15, 1848, and died September 8, 1920.

His earliest paternal American ancestor was John Morse who came from England in 1639 and settled in New Haven.

His father, Harmon Morse, was a believer in hard work, few holidays, and little schooling. He looked upon all forms of recreation as objectionable. The death of the boy's mother, when he was too young to remember her, removed a much needed gracious and loving influence. His brother, Anson, and his young sister, Delia, were comrades and comforters in his life, which for the most part lacked the elements of love and geniality.

The courage and ambition of the boy overcame all obstacles. His maternal grandfather left a legacy whereby each of the three children was enabled to prepare for higher education, and thus Harmon was led to Amherst College entering in 1869. He was graduated from Amherst in 1873, then went to Göttingen, and received the degree of

Ph.D. from that university in 1875. While there he gave his time to chemistry as the principal subject and mineralogy as the subordinate. Wöhler was still living but had retired from active service. Nevertheless he spent part of his time in the laboratory and a few favored students, generally Americans, were given the privilege of working with him. Morse was one of these, and throughout his life he took delight in recalling his personal experiences with Wöhler. The active head of the laboratory was Hübner and it was with him that most of Morse's advanced chemical work was done. It is interesting to note that Hübner was distinctly an organic chemist and those who worked with him naturally tended to follow in that field. For some reason, however, very little of Morse's later work was in that field. His best work, that which gained him distinction, was really in physics, though, in reference to present custom, probably should be called physical chemistry or perhaps chemical physics.

Returning to America in 1875, Morse was given a minor assistantship at Amherst and spent the academic year there under Harris and Emerson. These two men have had a marked influence on the lives of many men. The number of chemists and geologists who had their early training under them I do not know, but I do know that among them were many of note. In Johns Hopkins alone there were two Amherst men, students of Emerson, who became successively professors of geology. I refer to George Huntington Williams and William Bullock Clark. Here also Morse came. I have elsewhere (see Science, November 26, 1920) told that story in brief and I may here repeat what I there said.

In 1875 it was announced that the Johns Hopkins University would begin its work in the year 1876. Shortly after it became known that the writer of this notice was to be the professor of chemistry in the new university he received a call from Morse who brought a letter of introduction from Emerson. This letter led me to take more than ordinary interest in the bearer. Whatever we were to do in Baltimore, it seemed clear that I should need an assistant, and I told him I would in due time arrange for his appointment. Hearing a little later of the fellowships that were to be awarded I secured one of these for Morse and so his connection with the Johns Hopkins University began. Before the doors were opened, however, he was designated associate, and we began our work together for better or for worse. We had no

laboratory. We had less than a handful of students. What was to come of it? I need not go into the story thus suggested except to say that we were absolutely untrammeled and left to work out our own salvation. Morse and I were of one mind as to the object to be attained and there were no discussions in regard to the methods to be adopted. They were not original, but they had never been tried in this country. There had never been an opportunity. The opportunity that many of us had hoped for, had dreamed of, was furnished by the bounty of Johns Hopkins and the wisdom of his trustees and of President Gilman.

Morse remained an associate until 1883, when he became an associate professor. In 1892 he was promoted to be professor of inorganic and analytical chemistry, and in 1908 he became director of the chemical laboratory. In 1916 he withdrew from active service and became professor emeritus.

From the beginning of our work in the new university the importance of research was emphasized. That was indeed its most characteristic feature. Morse was as anxious as any of us to take part in this work. For one reason and another it was some time before he got going. To be sure he did show his hand in some small and rather unpromising pieces of work and I think he became discouraged, but he was faithful to his teaching. Gradually, however, his researches opened up new fields and he began their exploration. This is not the place for a full review of his contributions, and those of his last years so overshadow all that preceded that a reference to these alone will do substantial justice to his memory.

In the early nineties he turned his attention seriously to the question of the stability of solutions of potassium permanganate, and in 1896 he published an article on "The production of permanganic acid by manganese superoxide," A. J. Hopkins and M. S. Walker appearing as joint authors. Pursuing this subject Morse and H. G. Byers in 1900 published an article "On the cause of the evolution of oxygen when oxidisable gases are absorbed by permanganic acid." The results were such that it became desirable to obtain an aqueous solution of pure permanganic acid. It was decided to prepare this by dissolving the heptoxide in water. In an article by Morse and J. C. Olsen that appeared in 1900 occurs the following passage:

(We) accordingly prepared a quantity of the anhydride by mixing potassium permanganate and concentrated sulphuric acid in vessels cooled by ice and salt. We soon learned, however, that something more than a low temperature is essential to safety in handling the product; for a minute quantity of the anhydride — certainly less than half a drop — which had been separated from the sulphuric acid, exploded with great violence and with disastrous results to one of us.[1] Some idea of the force of the explosion may be gained from the fact that one of the flying fragments of glass passed entirely through a burette which was mounted in the vicinity, leaving holes over half the diameter of the burette, edges of which were entirely free from cracks. After this experience, we decided to abandon the anhydride as a source of the acid, and to work out, if practicable, an electrolytic method of separating it from its salts.

The electrolytic method worked very satisfactorily, and led to the further use of this method in the preparation of osmotic membranes. The first results of this investigation are given in an article by Morse and D. W. Horn that appeared in 1901. They say:

In this connection, it occurred to the authors that if a solution of a copper salt and one of potassium ferrocyanide are separated by a porous wall which is filled with water, and a current is passed from an electrode in the former to another in the latter solution the copper and the ferrocyanogen ions must meet in the interior of the wall and separate as copper ferrocyanide at all points of meeting, so that in the end there should be built up a continuous membrane well supported on either side by the material of the wall. The results of our experiments in this direction appear to have justified the expectation and to be worthy of a brief preliminary notice.

This marks the real beginning of the work on osmotic pressure with which the name of Morse will always be associated. But before the cells were available and therefore before any reliable measurements could be made, years of patient, skilful work were still necessary. Difficulties that seemed insurmountable frequently arose and necessitated new efforts. It must be said that some of us in the laboratory, including myself, at times lost faith in the ultimate success of the work and were perhaps inclined to advise the use of cells that were not

[1] To make this story complete it should be added that Morse was the "one of us" here referred to. A piece of glass passed through the tissues of his neck in close proximity to the jugular vein. His escape from death was almost miraculous.

perfect. But Morse went steadily on. He had in mind a practically perfect cell that could be used for high pressures as well as low. He tried all sorts and conditions of clay and after many, many discouragements he succeeded in finding what he wanted and in making a satisfactory glaze quite different from any available, and he achieved success.

In 1902 he and J. C. W. Frazer described "The preparation of cells for the measurement of high osmotic pressures." A careful reading of this article will give some idea of the tremendous difficulties that were met and overcome. The closing paragraph may be advantageously quoted in this connection:

> The difficulties of construction are by no means completely overcome, and we have in view a number of changes which we hope will prove of advantage. That these difficulties are of great magnitude will be realized if one considers that in our last experiment the pressure which was measured and which was still below what we were called upon to control would suffice to raise a column of water at 20° to a point 15 meters higher than the top of the Eiffel tower, or which would raise from its base a marble shaft whose height is 120 meters. These comparisons will perhaps make it clear that the most painstaking attention to every detail of construction is absolutely essential to success when an apparatus like ours is to be made up of several parts, consisting of different materials, and which must be united without the usual mechanical means of securing strong joints.

Soon after this the Carnegie Institution of Washington lent its powerful aid to the large investigation thus begun. In 1914 the institution published a memoir entitled "The Osmotic Pressure of Aqueous Solutions: Report on Investigations made in the Chemical Laboratory of the Johns Hopkins University during the years 1899–1913. By H. N. Morse." In it is given a detailed account of this remarkable piece of experimental work. Any one who reads it understandingly will recognize that no one but a master of experiment could have done this. The work required the highest degree of resourcefulness and skill, of patience and persistence. Any one of ordinary caliber would have stopped short of the accomplishment. Morse was not satisfied with anything but perfection as nearly as this could be reached, and as it never can be reached he worried about the residual no matter how small it might be. In the concluding chapter of the Carnegie Memoir occur these words:

The work reported upon in the preceding chapters is only a fraction of the task which the author hopes to accomplish, or to see accomplished by others. The investigation — already fifteen years old — was undertaken, in the first instance, with a view to developing a practicable and fairly precise method for the direct measurement of the osmotic pressure of aqueous solutions. The need of such a method for the investigation of solutions seemed to the author very great and very urgent.

Honors came to him rather late but they came, the chief among these was the award of the Avogadro Medal of the Turin Academy of Sciences, in 1916.

In 1911 an international congress of scientists assembled at Turin, Italy, to celebrate the centennial of the announcement of the hypothesis of Avogadro. Those in attendance decided to award a medal to be known as the Avogadro Medal. This medal was to be awarded to the investigator who should, in the judgment of the awarding committee, make the most valuable contribution to the subject of molecular physics during the years 1912, 1913 and 1914.

A few words in regard to Morse, the man. He was quiet and uneffusive. He did not care for the ordinary intercourse with his fellowmen. He lived, when not in the laboratory, for his family and a few kindred spirits. He married twice and had four children — a daughter and three sons. His second wife, who was Miss Elizabeth Dennis Clark, of Portland, Maine, his daughter and two sons survive him. In his later years his wife was of great assistance to him in preparing his articles for publication and was a true helpmate in every way.

For many years he spent his summers at Chebeague in the beautiful Casco Bay. Here he had a simple comfortable cottage and a garden. He delighted to work, both in and out of the house, and this gave him his exercise. He was rather stout and he knew that he needed exercise to keep his weight down. He therefore indulged in walking, bicycling, and finally in motoring, and he managed to keep fairly well. But after his retirement in 1916, his health failed. His strength gave out and his courage also. He did not dare to take his car out of the garage, and his walks were very short. I saw him in May, just before he went to Maine, and thought he seemed more like his old self. He even talked of taking up his work again. It was not to be. I heard nothing from him after that. And then came the dispatch

announcing his rather sudden and entirely unexpected death. He was buried at Amherst, a place that meant so much to him — where he had spent his college years and for some time had had a summer home.

IRA REMSEN.

EDWARD HALL NICHOLS (1864–1922).

Fellow in Class II, Section 4, 1913.

Edward Hall Nichols was born in Reading, Mass., January 6, 1864. His death occurred in Boston on June 12, 1922. The end may be considered a happy one, for it came in the active performance of his beneficent professional duty, suddenly and without prolonged anxiety or suffering. His career was a noteworthy one, not only for its useful activity, but also for its distinction in various diverse accomplishments. He was a proficient surgeon, an excellent teacher, both in surgical pathology and in clinical surgery, and a leading esteemed surgical practitioner. He was independent and thorough in his pathological research and his contributions were of importance.

That of the work of the Cancer Research Commission was characterized by marked charity, independent and sound statement; it cleared the way of much confusion of opinion and was of much assistance to his successors on the Harvard Cancer Commission. Perhaps his most important research was on the microscopic pathology of Arthritis Deformans which in thoroughness of investigation, definiteness of objective and in its conclusions could be regarded as the most important work on the subject as yet published.

For several years Professor Nichols served on the Committee to regulate the athletics at Harvard University and his advice and influence in promoting sound training and in improving true sportsmanship were highly appreciated by all interested in the improvement of college sport. He was selected by President Roosevelt as a member of a committee to draw up needed rules for the improved regulation of college foot ball, which saved the game from possible brutality and increased its spectacular popularity. In his college days, an unusual ball player, he never lost his enthusiasm in all proficiency in college athletics and his advice as a coach and medical adviser was of great assistance. His most important contribution to the domain of applied

surgery was in the Surgery of Diseases of Bones and Joints. Many important contributions to surgical literature have been made by Dr. Nichols, and he left unfinished portions of a work on Surgical pathology in coöperation with Professor Mallory. It is expected that the work will be finished.

The culminating effort in Dr. Nichols' career may be considered his directorship of two Hospital Units in France during the late war. The first was somewhat unusual and was organized and supported under the authority of Harvard University before the United States went into the war. The command was enrolled and served under British control and commission, though still retaining American citizenship, an arrangement especially made by the British government and involved at the outset tact and firmness on the part of the director in bringing a raw medical group, well trained for professional work in civic life, but needing the regulations under military routine.

After America went into the great war, Dr. Nichols headed another Hospital Unit, organized from the draft of the Boston City Hospital. This service continued until the end of the war.

Like many others, some time was needed before Dr. Nichols recovered from the war strain. He was, however, at the time of his death, again in full promise of his unusual abilities with every expectation of many years of useful activity. His death deprived the profession of one of its valued leaders.

Dr. Nichols is survived by his widow, Mrs. Elizabeth J. Nichols, and by a son and daughter.

EDWARD H. BRADFORD.

EDWARD JAMES YOUNG (1829–1906).

Fellow in Class III, Section 2, 1870.

Edward James Young was born in Boston April 1, 1829, and died in Waltham, June 23, 1906. His father was Dr. Alexander Young, minister of the New South church in Boston, but more widely known for his very useful books "Chronicles of the Pilgrim Fathers" and "Chronicles of the First Planters of the Colony of Massachusetts Bay." In 1835 he entered the Chauncy-Hall School, under the principalship of

its founder, Gideon F. Thayer, and passed in 1839 to the Boston Latin School of which Epes Sargent Dixwell was then Head Master. He graduated from Harvard College in the class of 1848. For the next two years he was a teacher in the Brimmer School and the Boston Latin School. In 1850 he entered the Harvard Divinity School which was then at a low ebb academically, having but two resident professors. Young seems to have exhausted the resources of the School in two years, for in 1852 he went to Germany where he spent four years in theological study, principally at Göttingen and Halle. At that time in Germany theology was passing through a period of reaction from the powerful influence of Schleiermacher, coinciding with the political reaction after the troubles of 1848. Neo-Lutherans were sharply attacking both the Reformed Church and the Party of Union inspired not more by zeal for orthodoxy than by ecclesiastical and political chauvinism. Of this conflict, Young gave an excellent account in three articles published in the Christian Examiner of May and November, 1855 and January 1856, in one of which he made a vigorous plea for the enlargement of theological education at Harvard. These articles had been preceded by an elaborate survey of recent theological publications in Germany (Christian Examiner, May 1854) and a translation of the introductory article of the new "Protestant Church Gazette" by H. Krause (Monthly Religious Magazine, March 1854). He also translated into English the first volume of Erdmann's History of Philosophy which, however, failed to find a publisher. Returning to this country, he was ordained pastor of the Channing Religious Society in Newton, (June 18, 1857), where he remained until 1869 when he was appointed Hancock Professor of Hebrew and other Oriental Languages and Dexter Lecturer on Biblical Literature in Harvard University. For this position he had served an apprenticeship for one year as teacher of the Bible in the Boston School for the Ministry. But he came to Harvard at a peculiarly unpropitious time for a teacher of Hebrew. The language was still required but students had lost interest in it on account of changing opinions as to the inspiration and authority of the Bible coincident with broadening theories concerning the function of a minister in the life of the community. It was often argued that if the teacher were more interesting, the students would be more interested whereas the real reason lay deeper than the merits or demerits of any particular instructor. In addition,

the science of the Higher Criticism of the Old Testament was becoming better known and theological students were keenly interested in its results which, however, required for their effective presentation a broader training, greater imaginative power and a more consistently held point of view than could be justly expected of a teacher trained in earlier conditions. Accordingly Professor Young's position at Harvard soon became exceptionally difficult and in 1880 he resigned his chair and returned to the life of a parish minister. On November 14, 1880, he was installed pastor of the Unitarian Church in Waltham which he served until October 30, 1892, but continued to reside in Waltham until his death in 1906.

Dr. Young (the degree of S.T.D. was conferred upon him by Tufts in 1887) was an active member of many learned and religious societies to most of which he also rendered valuable official service. He was recording secretary of the Massachusetts Historical Society from 1883 to 1906; secretary of the Ministers' Club from 1874 to 1899; president of the Society for the Promotion of Theological Education from 1894 to 1906. As a teacher, he is reported to have been didactic rather than stimulating, more apt to catalogue the opinions of others than to state his own conclusions. His publications consist of Memoirs prepared for the Massachusetts Historical Society and published in its Proceedings (February 1881, J. L. Diman; December 1895, O. B. Frothingham; Jan. 1896, A. P. Peabody), essays and occasional sermons and addresses, the most important of which were: Oration at the Two Hundredth Anniversary of the battle of Green Hill, Sudbury, Boston, 1876. The Value of the study of Hebrew for a Minister (Unitarian Review, May 1879); Subjects for Master's degree in Harvard 1655–1791 (Proceedings of Massachusetts Historical Society, June 1880); Early Religious Customs of New England, Cambridge, 1882. He also wrote a memoir of the life of Samuel Abbot Smith contained in a volume of the latter's sermons, Christian Lessons and a Christian Life, Boston, 1866.

William W. Fenn.

American Academy of Arts and Sciences

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[1] Died May 15, 1923. [2] Died June 14, 1923. [3] Died May 11, 1923.

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(Corrected to July 1, 1923.)

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Harry Ellsworth Clifford . . . . . Newton
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Theodore Harwood Dillon . . . . . Cambridge
Gano Dunn . . . . . New York, N. Y.
William Frederick Durand . . . . . Palo Alto, Cal.
Frederic Harold Fay . . . . . Boston
Desmond FitzGerald . . . . . Brookline

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George Washington Goethals . . . . . New York, N. Y.
John Hays Hammond . . . . . New York, N. Y.
Ira Nelson Hollis . . . . . Worcester
William Hovgaard . . . . . Brookline
Hector James Hughes . . . . . Cambridge
Alexander Crombie Humphreys . . . . . New York, N. Y.
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George Chandler Whipple . . . . . Cambridge
Robert Simpson Woodward . . . . . Washington, D. C.
Joseph Ruggles Worcester . . . . . Boston

CLASS II.— *Natural and Physiological Sciences.*— 188.

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Wallace Walter Atwood . . . . . Worcester
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Norman Levi Bowen . . . . . Washington, D. C.

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Merritt Lyndon Fernald . . . . . Cambridge
Robert Almer Harper . . . . . New York, N. Y.
John George Jack . . . . . East Walpole
Edward Charles Jeffrey . . . . . Cambridge
Fred Dayton Lambert . . . . . Tufts College
Jacob Goodale Lipman . . . . . New Brunswick, N. J.
Burton Edward Livingston . . . . . Baltimore, Md.
George Richard Lyman . . . . . Morgantown, W. Va.
Elmer Drew Merrill . . . . . Manila, P. I.
Winthrop John Vanleuven Osterhout . . . . . Cambridge

Charles Vancouver Piper . . . . . Washington, D. C.
Alfred Rehder . . . . . Jamaica Plain
Benjamin Lincoln Robinson . . . . . Cambridge
Charles Sprague Sargent . . . . . Brookline
William Albert Setchell . . . . . Berkeley, Cal.
Arthur Bliss Seymour . . . . . Cambridge
Erwin Frink Smith . . . . . Washington, D. C.
John Donnell Smith . . . . . Baltimore, Md.
Elvin Charles Stakman . . . . . St. Paul, Minn.
William Codman Sturgis . . . . . New York, N. Y.
Roland Thaxter . . . . . Cambridge
William Trelease . . . . . Urbana, Ill.
William Henry Weston, Jr. . . . . Cambridge

CLASS II., SECTION III.— *Zoölogy and Physiology.*— 58.

Nathan Banks . . . . . Cambridge
Thomas Barbour . . . . . Boston
Francis Gano Benedict . . . . . Boston
Henry Bryant Bigelow . . . . . Concord
Robert Payne Bigelow . . . . . Brookline
William T. Bovie . . . . . Milton
John Lewis Bremer . . . . . Boston
Charles Thomas Brues . . . . . Boston
Hermon Cary Bumpus . . . . . Duxbury
Walter Bradford Cannon . . . . . Cambridge
Thorne Martin Carpenter . . . . . Boston
William Ernest Castle . . . . . Belmont
Charles Value Chapin . . . . . Providence, R. I.
Benjamin Preston Clark . . . . . Boston
Samuel Fessenden Clarke . . . . . Williamstown
Edwin Grant Conklin . . . . . Princeton, N. J.
Manton Copeland . . . . . Brunswick, Me.
Joseph Augustine Cushman . . . . . Sharon
William Healey Dall . . . . . Washington, D. C.
Charles Benedict Davenport . . . . Cold Spring Harbor, N. Y.
Gilman Arthur Drew . . . . . Woods Hole
Cecil Kent Drinker . . . . . Boston

Alexander Forbes . . . . . Milton
Samuel Henshaw . . . . . Cambridge
Leland Ossian Howard . . . . . Washington, D. C.
Herbert Spencer Jennings . . . . . Baltimore, Md.
Charles Willison Johnson . . . . . Brookline
Charles Atwood Kofoid . . . . . Berkeley, Cal.
Frederic Thomas Lewis . . . . . Waban
Ralph Stayner Lillie . . . . . Cleveland, O.
Jacques Loeb . . . . . New York, N. Y.
Richard Swann Lull . . . . . New Haven, Conn.
Edward Laurens Mark . . . . . Cambridge
Ernest Gale Martin . . . . . Palo Alto, Cal.
Albert Davis Mead . . . . . Providence, R. I.
Gerrit Smith Miller . . . . . Washington, D. C.
Edward Sylvester Morse . . . . . Salem
Herbert Vincent Neal . . . . . Tufts College
Henry Fairfield Osborn . . . . . New York, N. Y.
George Howard Parker . . . . . Cambridge
William Patten . . . . . Hanover, N. H.
Raymond Pearl . . . . . Baltimore, Md.
John Charles Phillips . . . . . Wenham
Henry Augustus Pilsbry . . . . . Philadelphia, Pa.
Herbert Wilbur Rand . . . . . Cambridge
Arthur Clarence Redfield . . . . . Boston
William Emerson Ritter . . . . . La Jolla, Cal.
Percy Goldthwait Stiles . . . . . Newtonville
John Eliot Thayer . . . . . Lancaster
William Lyman Underwood . . . . . Belmont
Addison Emory Verrill . . . . . Westville, Conn.
John Broadus Watson . . . . . New York, N. Y.
Arthur Wisswald Weysse . . . . . Boston
William Morton Wheeler . . . . . Jamaica Plain
Harris Hawthorne Wilder . . . . . Northampton
Edmund Beecher Wilson . . . . . New York, N. Y.
Frederick Adams Woods . . . . . New York, N. Y.
Robert Mearns Yerkes . . . . . Washington, D. C.

CLASS II., SECTION IV.— *Medicine and Surgery.*— 41.

Edward Hickling Bradford . . . . . Boston
Charles Macfie Campbell . . . . . Cambridge
Alexis Carrel . . . . . New York, N. Y.
Henry Asbury Christian . . . . . Boston
Stanley Cobb . . . . . Ponkapoag
Rufus Cole . . . . . New York, N. Y.
Harvey Cushing . . . . . Boston
David Linn Edsall . . . . . Cambridge
Simon Flexner . . . . . New York, N. Y.
Joseph Lincoln Goodale . . . . . Boston
Robert Battey Greenough . . . . . Boston
Ross Granville Harrison . . . . . New Haven, Conn.
William Henry Howell . . . . . Baltimore, Md.
Reid Hunt . . . . . Boston
Henry Jackson . . . . . Boston
Elliott Proctor Joslin . . . . . Boston
William Williams Keen . . . . . Philadelphia, Pa.
Roger Irving Lee . . . . . Cambridge
Robert Williamson Lovett . . . . . Boston
Frank Burr Mallory . . . . . Brookline
William James Mayo . . . . . Rochester, Minn.
Samuel Jason Mixter . . . . . Boston
Francis Weld Peabody . . . . . Boston
Theophil Mitchell Prudden . . . . . New York, N. Y.
William Lambert Richardson . . . . . Boston
Milton Joseph Rosenau . . . . . Brookline
Frederick Cheever Shattuck . . . . . Boston
Theobald Smith . . . . . Princeton, N. J.
Charles Wardell Stiles . . . . . Washington, D. C.
Richard Pearson Strong . . . . . Boston
William Sydney Thayer . . . . . Baltimore, Md.
Ernest Edward Tyzzer . . . . . Wakefield
Frederick Herman Verhoeff . . . . . Boston
Henry Pickering Walcott . . . . . Cambridge
John Warren . . . . . Boston
John Collins Warren . . . . . Boston

William Henry Welch . . . . . Baltimore, Md.
Francis Henry Williams . . . . . Boston
Simeon Burt Wolbach . . . . . Boston
Horatio Curtis Wood . . . . . Philadelphia, Pa.
Hans Zinsser . . . . . Boston

CLASS III.— *Moral and Political Sciences.*— 200.

SECTION I.— *Theology, Philosophy and Jurisprudence.*— 53.

Thomas Willing Balch . . . . . Philadelphia, Pa.
Simeon Eben Baldwin . . . . . New Haven, Conn.
Willard Bartlett . . . . . Brooklyn, N. Y.
Joseph Henry Beale . . . . . Cambridge
Charles Henry Brent . . . . . Buffalo, N. Y.
Howard Nicholson Brown . . . . . Boston
Charles Warren Clifford . . . . . New Bedford
Leslie Colby Cornish . . . . . Augusta, Me.
Edmund Burke Delabarre . . . . . Providence, R. I.
James De Normandie . . . . . Lincoln
Frederic Dodge . . . . . Belmont
Edward Staples Drown . . . . . Cambridge
William Harrison Dunbar . . . . . Cambridge
William Herbert Perry Faunce . . . . . Providence, R. I.
William Wallace Fenn . . . . . Cambridge
Frederick Perry Fish . . . . . Brookline
Paul Revere Frothingham . . . . . Boston
George Angier Gordon . . . . . Boston
Alfred Hemenway . . . . . Boston
William Ernest Hocking . . . . . Cambridge
Charles Evans Hughes . . . . . Washington, D. C.
Frederick John Foakes Jackson . . . . . New York, N. Y.
Charles Francis Jenney . . . . . Boston
William Lawrence . . . . . Boston
Frederick Lawton . . . . . Boston
Arthur Lord . . . . . Plymouth
William Caleb Loring . . . . . Boston
Nathan Matthews . . . . . Boston

William McDougall . . . . . Cambridge
Samuel Walker McCall . . . . . Winchester
Edward Caldwell Moore . . . . . Cambridge
John Bassett Moore . . . . . New York, N. Y.
James Madison Morton . . . . . Fall River
George Herbert Palmer . . . . . Cambridge
Charles Edwards Park . . . . . Boston
Leighton Parks . . . . . New York, N. Y.
Francis Greenwood Peabody . . . . . Cambridge
George Wharton Pepper . . . . . Philadelphia, Pa.
Roscoe Pound . . . . . Belmont
Elihu Root . . . . . New York, N. Y.
James Hardy Ropes . . . . . Cambridge
Arthur Prentice Rugg . . . . . Worcester
Austin Wakeman Scott . . . . . Cambridge
Henry Newton Sheldon . . . . . Boston
Moorfield Storey . . . . . Boston
William Howard Taft . . . . . Washington, D. C.
William Jewett Tucker . . . . . Hanover, N. H.
William Cushing Wait . . . . . Medford
Eugene Wambaugh . . . . . Cambridge
Edward Henry Warren . . . . . Boston
Winslow Warren . . . . . Dedham
Samuel Williston . . . . . Belmont
Woodrow Wilson . . . . . Washington, D. C.

CLASS III., SECTION II.— *Philology and Archæology.*— 56.

Francis Greenleaf Allinson . . . . . Providence, R. I.
William Rosenzweig Arnold . . . . . Cambridge
Maurice Bloomfield . . . . . Baltimore, Md.
Franz Boas . . . . . New York, N. Y.
Carl Darling Buck . . . . . Chicago, Ill.
Eugene Watson Burlingame . . . . . New Haven, Conn.
Edward Capps . . . . . Princeton, N. J.
George Henry Chase . . . . . Cambridge
Walter Eugene Clark . . . . . Chicago, Ill.
Roland Burrage Dixon . . . . . Cambridge

Franklin Edgerton . . . . . Philadelphia, Pa.
William Curtis Farabee . . . . . Philadelphia, Pa.
Jesse Walter Fewkes . . . . . Washington, D. C.
Jeremiah Denis Mathias Ford . . . . . Cambridge
Basil Lanneau Gildersleeve . . . . . Baltimore, Md.
Pliny Earle Goddard . . . . . New York, N. Y.
Charles Hall Grandgent . . . . . Cambridge
Louis Herbert Gray . . . . . Lincoln, Neb.
Charles Burton Gulick . . . . . Cambridge
Roy Kenneth Hack . . . . . Cambridge
William Arthur Heidel . . . . . Middletown, Conn.
George Lincoln Hendrickson . . . . . New Haven, Conn.
Bert Hodge Hill . . . . . Athens, Greece
Elijah Clarence Hills . . . . . Berkeley, Cal.
William Henry Holmes . . . . . Washington, D. C.
Edward Washburn Hopkins . . . . . New Haven, Conn.
Joseph Clark Hoppin . . . . . Pomfret, Conn.
Albert Andrew Howard . . . . . Cambridge
William Guild Howard . . . . . Cambridge
Aleš Hrdlička . . . . . Washington, D. C.
Eugene Xavier Louis Henry Hyvernat . . . . Washington, D. C.
Carl Newell Jackson . . . . . Cambridge
Hans Carl Gunther von Jagemann . . . . . Cambridge
James Richard Jewett . . . . . Cambridge
Alfred Louis Kroeber . . . . . Berkeley, Cal.
Kirsopp Lake . . . . . Cambridge
Henry Roseman Lang . . . . . New Haven, Conn.
Charles Rockwell Lanman . . . . . Cambridge
John Livingston Lowes . . . . . Cambridge
David Gordon Lyon . . . . . Cambridge
Clifford Herschel Moore . . . . . Cambridge
George Foot Moore . . . . . Cambridge
Hanns Oertel . . . . . Munich, Germany
Chandler Rathfon Post . . . . . Cambridge
Edward Kennard Rand . . . . . Cambridge
George Andrew Reisner . . . . . Cambridge
Edward Robinson . . . . . New York, N. Y.
Fred Norris Robinson . . . . . Cambridge

Rudolph Schevill . . . . . Berkeley, Cal.
Edward Stevens Sheldon . . . . . Cambridge
Herbert Weir Smyth . . . . . Cambridge
Franklin Bache Stephenson . . . . . Washington, D. C.
Charles Cutler Torrey . . . . . New Haven, Conn.
Alfred Marston Tozzer . . . . . Cambridge
Clark Wissler . . . . . New York, N. Y.
James Haughton Woods . . . . . Cambridge

CLASS III., SECTION III.— *Political Economy and History.*— 46.

Wilbur Cortez Abbott . . . . . Cambridge
Brooks Adams . . . . . Quincy
George Burton Adams . . . . . New Haven, Conn.
Charles McLean Andrews . . . . . New Haven, Conn.
John Spencer Bassett . . . . . Northampton
Carl Lotus Becker . . . . . Ithaca, N. Y.
Charles Jesse Bullock . . . . . Cambridge
Thomas Nixon Carver . . . . . Cambridge
Edward Channing . . . . . Cambridge
John Bates Clark . . . . . New York, N. Y.
Archibald Cary Coolidge . . . . . Boston
Richard Henry Dana . . . . . Cambridge
Clive Day . . . . . New Haven, Conn.
Davis Rich Dewey . . . . . Cambridge
Ephraim Emerton . . . . . Cambridge
Henry Walcott Farnam . . . . . New Haven, Conn.
Max Farrand . . . . . New Haven, Conn.
William Scott Ferguson . . . . . Cambridge
Irving Fisher . . . . . New Haven, Conn.
Worthington Chauncey Ford . . . . . Cambridge
Edwin Francis Gay . . . . . New York, N. Y.
Frank Johnson Goodnow . . . . . Baltimore, Md.
Evarts Boutell Greene . . . . . Champaign, Ill.
Arthur Twining Hadley . . . . . New Haven, Conn.
Albert Bushnell Hart . . . . . Cambridge
Charles Homer Haskins . . . . . Cambridge
Isaac Minis Hays . . . . . Philadelphia, Pa.

Charles Downer Hazen . . . . . New York, N. Y.
George La Piana . . . . . Cambridge
Henry Cabot Lodge . . . . . Nahant
Abbott Lawrence Lowell . . . . . Cambridge
William MacDonald . . . . . New York, N. Y.
Charles Howard McIlwain . . . . . Cambridge
Roger Bigelow Merriman . . . . . Cambridge
Samuel Eliot Morison . . . . . Concord
William Bennett Munro . . . . . Boston
Charles Lemuel Nichols . . . . . Worcester
James Ford Rhodes . . . . . Boston
William Milligan Sloane . . . . . New York, N. Y.
John Osborne Sumner . . . . . Boston
Frank William Taussig . . . . . Cambridge
William Roscoe Thayer . . . . . Cambridge
Frederick Jackson Turner . . . . . Cambridge
George Grafton Wilson . . . . . Cambridge
George Parker Winship . . . . . Charles River
Allyn Abbott Young . . . . . Cambridge

CLASS III., SECTION IV.— *Literature and the Fine Arts.*— 45.

Irving Babbitt . . . . . Cambridge
George Pierce Baker . . . . . Cambridge
William Sturgis Bigelow . . . . . Boston
Le Baron Russell Briggs . . . . . Cambridge
Charles Allerton Coolidge . . . . . Boston
Frederick Shepherd Converse . . . . . Boston
Samuel McChord Crothers . . . . . Cambridge
Wilberforce Eames . . . . . New York, N. Y.
Edward Waldo Emerson . . . . . Concord
William Emerson . . . . . Cambridge
Arthur Fairbanks . . . . . Cambridge
Frank Edgar Farley . . . . . Middletown, Conn.
Arthur Foote . . . . . Brookline
Edward Waldo Forbes . . . . . Cambridge
Kuno Francke . . . . . Gilbertsville, N. Y.
Daniel Chester French . . . . . New York, N. Y.

Horace Howard Furness . . . . . Philadelphia, Pa.
Robert Grant . . . . . Boston
Morris Gray . . . . . Boston
Chester Noyes Greenough . . . . . Cambridge
James Kendall Hosmer . . . . . Minneapolis, Minn.
Mark Antony DeWolfe Howe . . . . . Boston
Archer Milton Huntington . . . . . New York, N. Y.
George Lyman Kittredge . . . . . Cambridge
William Coolidge Lane . . . . . Cambridge
John Ellerton Lodge . . . . . Boston
Charles Martin Tornov Lœffler . . . . . Medfield
Charles Donagh Maginnis . . . . . Brookline
Allan Marquand . . . . . Princeton, N. J.
Albert Matthews . . . . . Boston
Harold Murdock . . . . . Brookline
William Allan Neilson . . . . . Northampton
William Lyon Phelps . . . . . New Haven, Conn.
Arthur Kingsley Porter . . . . . Cambridge
Herbert Putnam . . . . . Washington, D. C.
Denman Waldo Ross . . . . . Cambridge
Paul Joseph Sachs . . . . . Cambridge
John Singer Sargent . . . . . London, Eng.
Ellery Sedgwick . . . . . Boston
Henry Dwight Sedgwick . . . . . Cambridge
Richard Clipston Sturgis . . . . . Boston
Charles Howard Walker . . . . . Boston
Owen Wister . . . . . Philadelphia, Pa.
George Edward Woodberry . . . . . Beverly
Charles Henry Conrad Wright . . . . . Cambridge

FOREIGN HONORARY MEMBERS.—65.

(Number limited to seventy-five.)

Class I.— *Mathematical and Physical Sciences.*— 24.

Section I.— *Mathematics and Astronomy.*— 8.

Johann Oskar Backlund	Petrograd
Arthur Stanley Eddington	Cambridge
Jacques Salomon Hadamard	Paris
Godfrey Harold Hardy	Oxford
Felix Klein	Göttingen
Tullio Levi-Civita	Rome
Charles Emile Picard	Paris
Charles Jean de la Vallée Poussin	Louvain

Class I., Section II.— *Physics.*— 7.

Svante August Arrhenius	Stockholm
Oliver Heaviside	Torquay
Sir Joseph Larmor	Cambridge
Hendrik Antoon Lorentz	Haarlem
Max Planck	Berlin
Sir Ernest Rutherford	Cambridge
Sir Joseph John Thomson	Cambridge

Class I., Section III.— *Chemistry.*— 4.

Fritz Haber	Berlin
Henri Louis Le Chatelier	Paris
Wilhelm Ostwald	Leipsic
William Henry Perkin	Oxford

Class I., Section IV.— *Technology and Engineering.*— 5.

Heinrich Müller Breslau	Berlin
Ferdinand Foch	Paris

Joseph Jacques Césaire Joffre . . . . . Paris
Vsevolod Evgenievich Timonoff . . . . . Petrograd
William Cawthorne Unwin . . . . . London

CLASS II.— *Natural and Physiological Sciences.*— 22.

SECTION I.— *Geology, Mineralogy, and Physics of the Globe.*— 10.

Frank Dawson Adams . . . . . Montreal
Charles Barrois . . . . . Lille
Waldemar Christofer Brögger . . . . . Christiania
Sir Archibald Geikie . . . . . Haslemere, Surrey
Viktor Goldschmidt . . . . . Heidelberg
Albert Heim . . . . . Zürich
Emmanuel de Margerie . . . . . Paris
Gustaf Adolf Frederik Molengraaff . . . . . Delft
Sir William Napier Shaw . . . . . London
Johan Herman Lie Vogt . . . . . Trondhjem

CLASS II, SECTION II.— *Botany.*— 5.

John Briquet . . . . . Geneva
Adolf Engler . . . . . Berlin
Ignatz Urban . . . . . Berlin
Hugo de Vries . . . . . Lunteren
Eugene Warming . . . . . Copenhagen

CLASS II.— SECTION III.— *Zoölogy and Physiology.*— 3.

Maurice Caullery . . . . . Paris
Sir Edwin Ray Lankester . . . . . London
George Henry Falkiner Nuttall . . . . . Cambridge

CLASS II., SECTION IV.— *Medicine and Surgery.*— 4.

Rt. Hon. Sir Thomas Clifford Allbutt . . . . . Cambridge
Sir Thomas Barlow, Bart . . . . . London
Francis John Shepherd . . . . . Montreal
Sir Charles Scott Sherrington . . . . . Oxford

Class III.— *Moral and Political Sciences.*— 19.

Section I.— *Theology, Philosophy and Jurisprudence.*— 3.

Rt. Hon Arthur James Balfour, Earl of Balfour . . . Prestonkirk
Raymond Poincaré . . . . . Paris
Rt. Hon. Sir Frederick Pollock, Bart. . . . . London

Section II.— *Philology and Archæology.*— 6.

Wilhelm Dörpfeld . . . . . Athens
Henri Guy . . . . . Grenoble
Hermann Georg Jacobi . . . . . Bonn
Arthur Anthony Macdonell . . . . . Oxford
Alfred Percival Maudslay . . . . . Hereford
Ramon Menendez Pidal . . . . . Madrid

Section III.— *Political Economy and History.*— 5.

Adolf Harnack . . . . . Berlin
Alfred Marshall . . . . . Cambridge
Rt. Hon. John Morley, Viscount Morley of Blackburn . . . London
Henri Pirenne . . . . . Ghent
Rt. Hon. Sir George Otto Trevelyan, Bart. . . . . London

Section IV.— *Literature and the Fine Arts.*— 5.

Georg Brandes . . . . . Copenhagen
Thomas Hardy . . . . . Dorchester
Jean Adrien Antoine Jules Jusserand . . . . Washington, D. C.
Rudyard Kipling . . . . . Burwash
Sir Sidney Lee . . . . . London

STATUTES AND STANDING VOTES

STATUTES

Adopted November 8, 1911: *amended May* 8, 1912, *January* 8, *and May* 14, 1913, *April* 14, 1915, *April* 12, 1916, *April* 10, 1918, *May* 14, 1919, *February* 8, *April* 12, *and December* 13, 1922, *February* 14, *and March* 14, 1923.

CHAPTER I

The Corporate Seal

Article 1. The Corporate Seal of the Academy shall be as here depicted:

Article 2. The Recording Secretary shall have the custody of the Corporate Seal.

See Chap. v. art. 3; chap. vi. art. 2.

CHAPTER II

Fellows and Foreign Honorary Members and Dues

Article 1. The Academy consists of Fellows, who are either citizens or residents of the United States of America, and Foreign Honorary Members. They are arranged in three Classes, according to the Arts and Sciences in which they are severally proficient, and each Class is divided into four Sections, namely:

Class I. *The Mathematical and Physical Sciences*
- Section 1. Mathematics and Astronomy
- Section 2. Physics
- Section 3. Chemistry
- Section 4. Technology and Engineering

Class II. *The Natural and Physiological Sciences*
- Section 1. Geology, Mineralogy, and Physics of the Globe
- Section 2. Botany
- Section 3. Zoölogy and Physiology
- Section 4. Medicine and Surgery

Class III. *The Moral and Political Sciences*
- Section 1. Theology, Philosophy, and Jurisprudence
- Section 2. Philology and Archaeology
- Section 3. Political Economy and History
- Section 4. Literature and the Fine Arts

Article 2. The number of Fellows shall not exceed Six hundred, of whom not more than Four hundred shall be residents of Massachusetts, nor shall there be more that Two hundred and ten in any one Class.

Article 3. The number of Foreign Honorary Members shall not exceed Seventy-five. They shall be chosen from among citizens of foreign countries most eminent for their discoveries and attainments in any of the Classes above enumerated. There shall not be more than Twenty-five in any one Class.

Article 4. If any person, after being notified of his election as Fellow, shall neglect for six months to accept in writing, or, if a Fellow

resident within fifty miles of Boston shall neglect to pay his Admission Fee, his election shall be void; and if any Fellow resident within fifty miles of Boston shall neglect to pay his Annual Dues for six months after they are due, provided his attention shall have been called to this Article of the Statutes in the meantime, he shall cease to be a Fellow; but the Council may suspend the provisions of this Article for a reasonable time.

With the previous consent of the Council, the Treasurer may dispense (*sub silentio*) with the payment of the Admission Fee or of the Annual Dues or both whenever he shall deem it advisable. In the case of officers of the Army or Navy who are out of the Commonwealth on duty, payment of the Annual Dues may be waived during such absence if continued during the whole financial year and if notification of such expected absence be sent to the Treasurer. Upon similar notification to the Treasurer, similar exemption may be accorded to Fellows subject to Annual Dues, who may temporarily remove their residence for at least two years to a place more than fifty miles from Boston.

If any person elected a Foreign Honorary Member shall neglect for six months after being notified of his election to accept in writing, his election shall be void.

See Chap. vii. art. 2.

ARTICLE 5. Every Fellow resident within fifty miles of Boston hereafter elected shall pay an Admission Fee of Ten dollars.

Every Fellow resident within fifty miles of Boston shall, and others may, pay such Annual Dues, not exceeding Fifteen dollars, as shall be voted by the Academy at each Annual Meeting, when they shall become due; but any Fellow shall be exempt from the annual payment if, at any time after his admission, he shall pay into the treasury Two hundred dollars in addition to his previous payments.

All Commutations of the Annual Dues shall be and remain permanently funded, the interest only to be used for current expenses.

Any Fellow not previously subject to Annual Dues who takes up his residence within fifty miles of Boston, shall pay to the Treasurer within three months thereafter Annual Dues for the current year, failing which his Fellowship shall cease; but the Council may suspend the provisions of this Article for a reasonable time.

Only Fellows who pay Annual Dues or have commuted them may

hold office in the Academy or serve on the Standing Committees or vote at meetings.

ARTICLE 6. Fellows who pay or have commuted the Annual Dues and Foreign Honorary Members shall be entitled to receive gratis one copy of all Publications of the Academy issued after their election.

See Chap. x, art. 2.

ARTICLE 7. Diplomas signed by the President and the Vice-President of the Class to which the member belongs, and countersigned by the Secretaries, shall be given to Foreign Honorary Members and to Fellows on request.

ARTICLE 8. If, in the opinion of a majority of the entire Council, any Fellow or Foreign Honorary Member shall have rendered himself unworthy of a place in the Academy, the Council shall recommend to the Academy the termination of his membership; and if three fourths of the Fellows present, out of a total attendance of not less than fifty at a Stated Meeting, or at a Special Meeting called for the purpose, shall adopt this recommendation, his name shall be stricken from the Roll.

See Chap. iii.; chap. vi. art. 1; chap. ix, art. 1, 7; chap. x. art. 2.

CHAPTER III

ELECTION OF FELLOWS AND FOREIGN HONORARY MEMBERS

The procedure in the election of Fellows and Foreign Honorary Members shall be as follows:

Nominations to Fellowship or Foreign Honorary Membership in any Section must be signed by two Fellows of that Section or by three Fellows of any Sections, and sent to the Corresponding Secretary accompanied by a statement of the qualifications of the nominee and brief biographical data.

Notice shall be sent to every Fellow not later than the fifteenth of January in each year, reminding him that all nominations must be in the hands of the Corresponding Secretary before the fifteenth of February following.

A list of the nominees, giving a brief account of each, with the names

of the nominators, shall be sent to every Fellow with a request that he return the list with such confidential comments and indications of preference as he may choose to make.

All the nominations, with any comments thereon and with expressions of preference on the part of the Fellows, shall be referred to the appropriate Class Committees, which shall canvass them, and report their recommendations in writing to the Council before the Stated Meeting of the Academy in April.

Elections of Fellows and Foreign Honorary Members shall be made by the Council before the Annual Meeting in May, and announced at that meeting.

Persons nominated in any year, but not elected, may be carried over to the list of nominees for the next year at the discretion of the Council, but shall not be further continued unless renominated.

See Chap. ii.; chap. vi. art. 1; chap. ix. art. 1.

CHAPTER IV

Officers

Article 1. The Officers of the Academy shall be a President (who shall be Chairman of the Council), three Vice-Presidents (one from each Class), a Corresponding Secretary (who shall be Secretary of the Council), a Recording Secretary, a Treasurer, and a Librarian, all of whom shall be elected by ballot at the Annual Meeting, and shall hold their respective offices for one year, and until others are duly chosen and installed.

There shall be also twelve Councillors, one from each Section of each Class. At each Annual Meeting three Councillors, one from each Class, shall be elected by ballot to serve for the full term of four years and until others are duly chosen and installed. The same Fellow shall not be eligible for two successive terms.

The Councillors, with the other officers previously named, and the Chairman of the House Committee, *ex officio*, shall constitute the Council.

See Chap. x, art. 1.

Article 2. If any officer be unable, through death, absence, or disability, to fulfil the duties of his office, or if he shall resign, his place

may be filled by the Council in its discretion for any part or the whole of the unexpired term.

ARTICLE 3. At the Stated Meeting in March, the President shall appoint a Nominating Committee of three Fellows having the right to vote, one from each Class. This Committee shall prepare a list of nominees for the several offices to be filled, and for the Standing Committees, and file it with the Recording Secretary not later than four weeks before the Annual Meeting.

See Chap. vi. art. 2.

ARTICLE 4. Independent nominations for any office, if signed by at least twenty Fellows having the right to vote, and received by the Recording Secretary not less than ten days before the Annual Meeting, shall be inserted in the call therefor, and shall be mailed to all the Fellows having the right to vote.

See Chap. vi. art. 2.

ARTICLE 5. The Recording Secretary shall prepare for use in voting at the Annual Meeting a ballot containing the names of all persons duly nominated for office.

CHAPTER V

THE PRESIDENT

ARTICLE 1. The President, or in his absence the senior Vice-President present (seniority to be determined by length of continuous fellowship in the Academy), shall preside at all meetings of the Academy. In the absence of all these officers, a Chairman of the meeting shall be chosen by ballot.

ARTICLE 2. Unless otherwise ordered, all Committees which are not elected by ballot shall be appointed by the presiding officer.

ARTICLE 3. Any deed or writing to which the Corporate Seal is to be affixed, except leases of real estate, shall be executed in the name of the Academy by the President or, in the event of his death, absence, or inability, by one of the Vice-Presidents, when thereto duly authorized.

See Chap. ii. art. 7; chap. iv. art. 1, 3; chap. vi. art. 2; chap. vii. art. 1; chap. ix. art. 6; chap. x. art. 1, 2; chap. xi. art. 1.

CHAPTER VI

The Secretaries

Article 1. The Corresponding Secretary shall conduct the correspondence of the Academy and of the Council, recording or making an entry of all letters written in its name, and preserving for the files all official papers which may be received. At each meeting of the Council he shall present the communications addressed to the Academy which have been received since the previous meeting, and at the next meeting of the Academy he shall present such as the Council may determine.

He shall notify all persons who may be elected Fellows or Foreign Honorary Members, send to each a copy of the Statutes, and on their acceptance issue the proper Diploma. He shall also notify all meetings of the Council; and in case of the death, absence, or inability of the Recording Secretary he shall notify all meetings of the Academy.

Under the direction of the Council, he shall keep a List of the Fellows and Foreign Honorary Members, arranged in their several Classes and Sections. It shall be printed annually and issued as of the first day of July.

See Chap. ii. art. 7; chap. iii. art. 2, 3; chap. iv. art. 1; chap. ix. art. 6; chap. x. art. 1; chap. xi. art. 1.

Article 2. The Recording Secretary shall have the custody of the Charter, Corporate Seal, Archives, Statute-Book, Journals, and all literary papers belonging to the Academy.

Fellows borrowing such papers or documents shall receipt for them to their custodian.

The Recording Secretary shall attend the meetings of the Academy and keep a faithful record of the proceedings with the names of the Fellows present; and after each meeting is duly opened, he shall read the record of the preceding meeting.

He shall notify the meetings of the Academy to each Fellow and by mail at least seven days beforehand, and in his discretion may also cause the meetings to be advertised; he shall apprise Officers and Committees of their election or appointment, and inform the Treasurer of appropriations of money voted by the Academy.

After all elections, he shall insert in the Records the names of the Fellows by whom the successful nominees were proposed.

He shall send the Report of the Nominating Committee in print to every Fellow having the right to vote at least three weeks before the Annual Meeting.

See Chap. iv. art. 3.

In the absence of the President and of the Vice-Presidents he shall, if present, call the meeting to order, and preside until a Chairman is chosen.

See Chap. i.; chap. ii. art. 7; chap. iv. art. 3, 4, 5; chap. ix. art. 6; chap. x. art. 1, 2; chap. xi. art. 1, 3.

ARTICLE 3. The Secretaries, with the Chairman of the Committee of Publication, shall have authority to publish such of the records of the meetings of the Academy as may seem to them likely to promote its interests.

CHAPTER VII

THE TREASURER AND THE TREASURY

ARTICLE 1. The Treasurer shall collect all money due or payable to the Academy, and all gifts and bequests made to it. He shall pay all bills due by the Academy, when approved by the proper officers, except those of the Treasurer's office, which may be paid without such approval; in the name of the Academy he shall sign all leases of real estate; and, with the written consent of a member of the Committee on Finance, he shall make all transfers of stocks, bonds, and other securities belonging to the Academy, all of which shall be in his official custody.

He shall keep a faithful account of all receipts and expenditures, submit his accounts annually to the Auditing Committee, and render them at the expiration of his term of office, or whenever required to do so by the Academy or the Council.

He shall keep separate accounts of the income of the Rumford Fund, and of all other special Funds, and of the appropriation thereof, and render them annually.

His accounts shall always be open to the inspection of the Council.

ARTICLE 2. He shall report annually to the Council at its March meeting on the expected income of the various Funds and from all

other sources during the ensuing financial year. He shall also report the names of all Fellows who may be then delinquent in the payment of their Annual Dues.

ARTICLE 3. He shall give such security for the trust reposed in him as the Academy may require.

ARTICLE 4. With the approval of a majority of the Committee on Finance, he may appoint an Assistant Treasurer to perform his duties, for whose acts, as such assistant, he shall be responsible; or, with like approval and responsibility, he may employ any Trust Company doing business in Boston as his agent for the same purpose, the compensation of such Assistant Treasurer or agent to be fixed by the Committee on Finance and paid from the funds of the Academy.

ARTICLE 5. At the Annual Meeting he shall report in print all his official doings for the preceding year, stating the amount and condition of all the property of the Academy entrusted to him, and the character of the investments.

ARTICLE 6. The Financial Year of the Academy shall begin with the first day of April.

ARTICLE 7. No person or committee shall incur any debt or liability in the name of the Academy, unless in accordance with a previous vote and appropriation therefor by the Academy or the Council, or sell or otherwise dispose of any property of the Academy, except cash or invested funds, without the previous consent and approval of the Council.

See Chap. ii. art. 4, 5; chap. vi. art. 2; chap. ix. art. 6; chap. x. art. 1, 2, 3; chap. xi. art. 1.

CHAPTER VIII

THE LIBRARIAN AND THE LIBRARY

ARTICLE 1. The Librarian shall have charge of the printed books, keep a correct catalogue thereof, and provide for their delivery from the Library.

At the Annual Meeting, as Chairman of the Committee on the Library, he shall make a Report on its condition.

ARTICLE 2. In conjunction with the Committee on the Library he shall have authority to expend such sums as may be appropriated by the Academy for the purchase of books, periodicals, etc., and for defraying other necessary expenses connected with the Library.

ARTICLE 3. All books procured from the income of the Rumford Fund or of other special Funds shall contain a book-plate expressing the fact.

ARTICLE 4. Books taken from the Library shall be receipted for to the Librarian or his assistant.

ARTICLE 5. Books shall be returned in good order, regard being had to necessary wear with good usage. If any book shall be lost or injured, the Fellow to whom it stands charged shall replace it by a new volume or by a new set, if it belongs to a set, or pay the current price thereof to the Librarian, whereupon the remainder of the set, if any, shall be delivered to the Fellow so paying, unless such remainder be valuable by reason of association.

ARTICLE 6. All books shall be returned to the Library for examination at least one week before the Annual Meeting.

ARTICLE 7. The Librarian shall have the custody of the Publications of the Academy. With the advice and consent of the President, he may effect exchanges with other associations.

See Chap. ii. art. 6; chap. x. art. 1, 2.

CHAPTER IX

THE COUNCIL

ARTICLE 1. The Council shall exercise a discreet supervision over all nominations and elections to membership, and in general supervise all the affairs of the Academy not explicitly reserved to the Academy as a whole or entrusted by it or by the Statutes to standing or special committees.

It shall consider all nominations duly sent to it by any Class Committee, and act upon them in accordance with the provisions of Chapter III.

With the consent of the Fellow interested, it shall have power to

make transfers between the several Sections, reporting its action to the Academy.

See Chap. iii. art. 2, 3; chap. x. art. 1.

ARTICLE 2. Seven members shall constitute a quorum.

ARTICLE 3. It shall establish rules and regulations for the transaction of its business, and provide all printed and engraved blanks and books of record.

ARTICLE 4. It shall act upon all resignations of officers, and all resignations and forfeitures of Fellowship; and cause the Statutes to be faithfully executed.

It shall appoint all agents and subordinates not otherwise provided for by the Statutes, prescribe their duties, and fix their compensation. They shall hold their respective positions during the pleasure of the Council.

ARTICLE 5. It may appoint, for terms not exceeding one year, and prescribe the functions of, such committees of its number, or of the Fellows of the Academy, as it may deem expedient, to facilitate the administration of the affairs of the Academy or to promote its interests.

ARTICLE 6. At its March meeting it shall receive reports from the President, the Secretaries, the Treasurer, and the Standing Committees, on the appropriations severally needed for the ensuing financial year. At the same meeting the Treasurer shall report on the expected income of the various Funds and from all other sources during the same year.

A report from the Council shall be submitted to the Academy, for action, at the March meeting, recommending the appropriation which in the opinion of the Council should be made.

On the recommendation of the Council, special appropriations may be made at any Stated Meeting of the Academy, or at a Special Meeting called for the purpose.

See Chap. x. art. 3.

ARTICLE 7. After the death of a Fellow or Foreign Honorary Member, it shall appoint a member of the Academy to prepare a biographical notice for publication in the Proceedings.

ARTICLE 8. It shall report at every meeting of the Academy such business as it may deem advisable to present.

See Chap. ii. art. 4, 5, 8; chap. iv. art. 1, 2; chap. vi. art. 1; chap. vii. art. 1; chap. xi. art. 1, 4.

CHAPTER X

STANDING COMMITTEES

ARTICLE 1. The Class Committee of each Class shall consist of the Vice-President, who shall be chairman, and the four Councillors of the Class, together with such other officer or officers annually elected as may belong to the Class. It shall consider nominations to Fellowship in its own Class, and report in writing to the Council such as may receive at a Class Committee Meeting a majority of the votes cast, provided at least three shall have been in the affirmative.

See Chap. iii. art. 2.

ARTICLE 2. At the Annual Meeting the following Standing Committees shall be elected by ballot to serve for the ensuing year:

(i) *The Committee on Finance,* to consist of three Fellows, who, through the Treasurer, shall have full control and management of the funds and trusts of the Academy, with the power of investing the funds and of changing the investments thereof in their discretion.

See Chap. iv. art. 3; chap. vii. art. 1, 4; chap. ix. art. 6.

(ii) *The Rumford Committee,* to consist of seven Fellows, who shall report to the Academy on all applications and claims for the Rumford Premium. It alone shall authorize the purchase of books, publications and apparatus at the charge of the income from the Rumford Fund, and generally shall see to the proper execution of the trust.

See Chap. iv. art. 3; chap. ix. art. 6.

(iii) *The Cyrus Moors Warren Committee,* to consist of seven Fellows, who shall consider all applications for appropriations from the income of the Cyrus Moors Warren Fund, and generally shall see to the proper execution of the trust.

See Chap. iv. art. 3; chap. ix. art. 6.

(iv) *The Committee of Publication,* to consist of three Fellows, one from each Class, to whom all communications submitted to the

Academy for publication shall be referred, and to whom the printing of the Proceedings and the Memoirs shall be entrusted.

It shall fix the price at which the Publications shall be sold; but Fellows may be supplied at half price with volumes which may be needed to complete their sets, but which they are not entitled to receive gratis.

Two hundred extra copies of each paper accepted for publication in the Proceedings or the Memoirs shall be placed at the disposal of the author without charge.

See Chap. iv. art. 3; chap. vi. art. 1, 3; chap. ix. art. 6.

(v) *The Committee on the Library*, to consist of the Librarian, *ex officio*, as Chairman, and three other Fellows, one from each Class, who shall examine the Library and make an annual report on its condition and management.

See Chap. iv. art. 3; chap. viii. art. 1, 2; chap. ix. art. 6.

(vi) *The House Committee*, to consist of three Fellows, who shall have charge of all expenses connected with the House, including the general expenses of the Academy not specifically assigned to the care of other Committees or Officers.

See Chap. iv. art. 1, 3; chap. ix. art. 6.

(vii) *The Committee on Meetings*, to consist of the President, the Recording Secretary, and three other Fellows, who shall have charge of plans for meetings of the Academy.

See Chap. iv. art. 3; chap. ix. art. 6.

(viii) *The Auditing Committee*, to consist of two Fellows, who shall audit the accounts of the Treasurer, with power to employ an expert and to approve his bill.

See Chap. iv. art. 3; chap. vii. art. 1; chap. ix. art. 6.

ARTICLE 3. The Standing Committees shall report annually to the Council in March on the appropriations severally needed for the ensuing financial year; and all bills incurred on account of these Committees, within the limits of the several appropriations made by the Academy, shall be approved by their respective Chairmen.

In the absence of the Chairman of any Committee, bills may be approved by any member of the Committee whom he shall designate for the purpose.

See Chap. vii. art. 1, 7; chap. ix. art. 6.

CHAPTER XI

Meetings, Communications, and Amendments

Article 1. There shall be annually eight Stated Meetings of the Academy, namely, on the second Wednesday of October, November, December, January, February, March, April and May. Only at these meetings, or at adjournments thereof regularly notified, or at Special Meetings called for the purpose, shall appropriations of money be made or amendments of the Statutes or Standing Votes be effected.

The Stated Meeting in May shall be the Annual Meeting of the Corporation.

Special Meetings shall be called by either of the Secretaries at the request of the President, of a Vice-President, of the Council, or of ten Fellows having the right to vote; and notifications thereof shall state the purpose for which the meeting is called.

A meeting for receiving and discussing literary or scientific communications may be held on the fourth Wednesday of each month, excepting July, August, and September; but no business shall be transacted at said meetings.

Article 2. Twenty Fellows having the right to vote shall constitute a quorum for the transaction of business at Stated or Special Meetings. Fifteen Fellows shall be sufficient to constitute a meeting for literary or scientific communications and discussions.

Article 3. Upon the request of the presiding officer or the Recording Secretary, any motion or resolution offered at any meeting shall be submitted in writing.

Article 4. No report of any paper presented at a meeting of the Academy shall be published by any Fellow without the consent of the author; and no report shall in any case be published by any Fellow in a newspaper as an account of the proceedings of the Academy without the previous consent and approval of the Council. The Council, in its discretion, by a duly recorded vote, may delegate its authority in this regard to one or more of its members.

Article 5. No Fellow shall introduce a guest at any meeting of the Academy until after the business has been transacted, and espe-

cially until after the result of the balloting upon nominations has been declared.

ARTICLE 6. The Academy shall not express its judgment on literary or scientific memoirs or performances submitted to it, or included in its Publications.

ARTICLE 7. All proposed Amendments of the Statutes shall be referred to a committee, and on its report, at a subsequent Stated Meeting or at a Special Meeting called for the purpose, two thirds of the ballot cast, and not less than twenty, must be affirmative to effect enactment.

ARTICLE 8. Standing Votes may be passed, amended, or rescinded at a Stated Meeting, or at a Special Meeting called for the purpose, by a vote of two thirds of the members present. They may be suspended by a unanimous vote.

See Chap. ii. art. 5, 8; chap. iii. chap. iv. art. 3, 4, 5; chap. v. art. 1; chap. vi. art. 1, 2; chap. ix. art. 8.

STANDING VOTES

1. Communications of which notice has been given to either of the Secretaries shall take precedence of those not so notified.

2. Fellows may take from the Library six volumes at any one time, and may retain them for three months, and no longer. Upon special application, and for adequate reasons assigned, the Librarian may permit a larger number of volumes, not exceeding twelve, to be drawn from the Library for a limited period.

3. Works published in numbers, when unbound, shall not be taken from the Hall of the Academy without the leave of the Librarian.

4. The Council, under such rules respecting nominations as it may prescribe, may elect as Associates of the Academy a limited number of men of mark in affairs or of distinguished service in the community.

Associates shall be entitled to the same privileges as Fellows, but shall not have the right to vote.

The admission fee and annual dues of Associates shall be the same as those of Fellows residing within fifty miles of Boston.

5. Communications offered for publication in the Proceedings or Memoirs of the Academy shall not be accepted for publication before the author shall have informed the Committee on Meetings of his readiness, either himself or through some agent, to use such time as the Committee may assign him at such meeting as may be convenient both to him and to the Committee, for the purpose of presenting to the Academy a general statement of the nature and significance of the results contained in his communication.

RUMFORD PREMIUM

In conformity with the terms of the gift of Sir Benjamin Thompson, Count Rumford, of a certain Fund to the American Academy of Arts and Sciences, and with a decree of the Supreme Judicial Court of Massachusetts for carrying into effect the general charitable intent and purpose of Count Rumford, as expressed in his letter of gift, the Academy is empowered to make from the income of the Rumford Fund, as it now exists, at any Annual Meeting, an award of a gold and a silver medal, being together of the intrinsic value of three hundred dollars, as a Premium to the author of any important discovery or useful improvement in light or heat, which shall have been made and published by printing, or in any way made known to the public, in any part of the continent of America, or any of the American Islands; preference always being given to such discoveries as, in the opinion of the Academy, shall tend most to promote the good of mankind; and, if the Academy sees fit, to add to such medals, as a further Premium for such discovery and improvement, a sum of money not exceeding three hundred dollars.

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